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A Lecture given in the Institute of Pathology and Research, St. Mary's Hospital, London, on May 5th, 1927,

BY DR. CARL PRAUSNITZ,
PROFESSOR OF BACTERIOLOGY AND HYGIENE IN THE UNIVERSITY OF BRESLAU.

THE first conclusive observation on the phenomenon of transmissible lysis in bacteria was made by Twort: that cocci obtained from glycerinated small-pox vaccine, when grown on agar, occasionally showed peculiar malformations of their colonies, which appeared as if gnawed away at the periphery by some foreign agent; and that by using filtrates of such cultures the malformation was produced at will in colonies of hitherto normal cocci. The second fundamental observations we owe to d'Herelle.

D'HERELLE'S OBSERVATIONS AND VIEWS.

It had for long been remarked that it is often impossible in dysentery patients to cultivate the causal micro-organism although, when once obtained, it grows well on ordinary laboratory media. D'Herelle assumed that in the intestine of such patients there must be present a substance harmful to the dysentery bacillus. In order to prove its existence, he passed emulsions of dysenteric stools through bacterial filters; the filtrate, free from micro-organisms visible or cultivable, when added to fresh broth cultures of the dysentery bacillus, not only inhibited their growth, but in a few hours completely dissolved them, leaving the broth absolutely limpid and sterile, as if no bacteria had ever been in it. The next advance in his research was made, when he found that addition of a small quantity of this limpid fluid to a fresh broth culture of dysentery bacilli brought about the same clarification and that the process could be repeated at will in subsequent passages. The clarifying power of the fluid increased from passage to passage, until it reached its maximum—at this stage it is as a rule active in a thousand millionfold dilution.

Further experiments were carried out with solid media. The mixtures of the cleared fluid with bacterial emulsion were spread over the surface of agar. When large quantities of the fluid were employed, the agar remained completely sterile; if the quantity was reduced, irregular isles of bacterial growth developed on the agar surface; on still further reduction of the fluid a uniform growth of bacteria was obtained, interrupted only here and there by circular spots or areas denuded of bacterial growth; the number of these clear areas was shown to be directly proportional to the quantity of the clear fluid added to the bacterial emulsion. It was thus proved that the agent producing this bacterial lysis was capable of endless reproduction in living bacterial cultures, that it was *enhanced* in its dissolving power by repeated passage through such living bacteria, and that it was a *particulate* substance; for otherwise the occurrence of the isolated lytic areas on the agar surface could not be satisfactorily explained.

The facts observed were explained by d'Herelle as due to a living micro-organism, minute in size as compared with the bacteria attacked, a filterable ultra-virus which he named the bacteriophage.

THE BACTERIOPHAGE.

Further researches showed that as a rule multiplication of the bacteriophage takes place only so long as the bacteria are actively proliferating. As yet it has not been possible to obtain any multiplication of the phage on killed bacteria. One step in this direction has, however, been made by Twort, who showed that a mixture of dead and living bacteria with the phage could under certain instances be completely dissolved, thus proving that under favourable circumstances even dead bacteria were attacked and dissolved by the phage. This has been confirmed by Bronfenbrenner and Muckenfuss.

The phage is specific to a certain extent. Some dysentery phages act only on certain strains of dysentery bacilli; on the other hand, many phages act on quite a number of other bacteria—e.g., a dysentery phage may dissolve not only Flexner, Shiga, Hiss-Russell, and Strong bacilli, but also typhoid, paratyphoid, coli, staphylococci, &c. Usually, however, a phage is primarily active only against one species of bacteria, although its "virulence" may be enhanced for other bacterial species by repeated passage through their cultures. Phages have been obtained from a large number of bacteria—e.g., plague, hæmorrhagic septicæmia, pyocyaneus, cocci. For a long time it was difficult to obtain a cholera bacteriophage, but Miss Meissner and I found a simple method, by intraperitoneal injection of sterile broth in guinea-pigs, of proving the presence of the phage in the normal guinea-pig.

Phages are normally present in the intestines of many animals, and also in fæcally polluted rivers, lakes, and sea-water. In the human intestine they are not often found, as was proved by me and Van der Reis on examining a large number of diseased and healthy persons with his intestinal cartridge method.

Bordet showed that animals can be *immunised* against the bacteriophage by repeated injections. With a serum thus obtained I found that the neutralisation of the phage by its corresponding antibacteriophage serum follows the "law of multiples" formulated by Ehrlich—i.e., if a given quantity of phage is rendered inert by a certain amount of the specific serum, then a multiple of the phage is rendered inert by the corresponding multiple of the serum.

Many disinfectants destroy the phage, yet on the whole their concentration and time of action must be considerably greater than is required for the destruction of most bacteria; it approximates more closely to that required for tubercle and spore-bearing bacteria. Lastly, the interesting fact has been demonstrated that in contact with a weak phage, the corresponding bacteria may become refractory to its action—i.e., they may lose their capacity of being killed and dissolved by the phage; this resistance towards the phage is hereditary to a certain extent and is very strictly specific (Bail).

The question of primary interest deals with the *nature* of the bacteriophage. D'Herelle's original view that it was a filterable virus has been much debated, and a number of different and contradictory hypotheses have been enunciated; these may be collected under the following main headings: (1) The phage is derived from the bacterium; it might be a bacterial fragment (Bail) or an autolytic ferment (Kabeshima). (2) The phage is derived from the host (Bordet). (3) A further suggestion, first made by Doerr, and elaborated by Eastwood, is that the bacteriophage action is due to an excess of the hormones which in their normal concentration stimulate bacterial growth; thus, the balance between assimilation and dissimilation would be removed in favour of the latter.

(1) IS THE PHAGE DERIVED FROM THE BACTERIAL CELL?

This view is shared by numerous authors who have succeeded in isolating phages from old laboratory stock strains of bacteria showing no outward signs of bacteriophagy. D'Herelle was the first to explain this observation by the assumption of "mixed cultures." In fact, knowing that the phage is found more or less regularly in the intestinal contents, and occasionally in other parts of the normal and diseased body, it is easily understood that bacteria isolated from man or animals may be contaminated with the phage; if the phage is weak, the bacteria may rapidly become refractory; in subcultures the bacteria will be propagated alongside of the phage indefinitely, the more so because it has been shown that in a culture of refractory bacteria there are always present some individuals less resistant, which will serve for the propagation of the phage. This explanation is particularly borne out by the careful experiments of Flu, who from such cultures succeeded in obtaining the bacteria "ultra-pure,"—i.e., free from the phage—and in subculturing these ultra-pure strains indefinitely without a phage reappearing in them. Still,

this view is strenuously opposed by numerous investigators, according to whose view, the bacteriophage is always derived from the bacterium. Two explanations are chiefly given for the supposed bacterial origin of the bacteriophage.

(*a*) According to Bail, bacteriophagal action is due to the formation of minute (filter-passing) fragments from the bacterial cells; these, on addition to normal bacteria, should attract and absorb a part of their nutritive substance, in the endeavour to attain the normal bacterial size and form. This must lead to the destruction of the bacteria deprived of part of their nutritive substance, and in this process fragmentation would occur afresh, and so on. This hypothesis would seem to be akin to the modern work of the French school on filterable forms of certain pathogenic bacteria, particularly the tubercle bacillus. However, I wish to emphasise that this "vampyre-theory" is open to several objections; chief of these is the following fact, found by Wollmann, Otto, and myself. A broth filtrate containing the phage needs must also contain dissolved products of the corresponding bacteria. If now animals are immunised against such bacteriophage broth, their serum is found to possess substances antagonistic both to the phage (antibacteriophage substances), and to the bacterium (agglutinins, complement-binding substances). If such a serum is treated with emulsions of the bacteria (technique of Castellani), it can be completely deprived of its antibacterial power, but its anti-bacteriophage titre remains absolutely unchanged. To my mind, this is proof positive that the substance of the phage is chemically distinct from that of the corresponding bacterium.

Further facts have been brought out in absorption tests carried out by Gildemeister. Alkaline colloids (oxide of alumina) do not absorb it at all, neutral colloids (blood coal) slightly, but *acid* colloids (oxide of silica, kieselgur) very strongly; a phage filtrate, shaken with SiO_2, may lose its lytic power completely; but from the absorbate the phage can be partially recovered by treatment with weak alkali (n/30 or n/100 ammonia). It would thus appear to be *electropositive*. This is corroborated by a research carried out in my Institute by Karl Koch, which showed that under the influence of a weak electric current under a potential of 100 volts the phage undergoes cataphoresis and wanders towards the cathode. Experiments on the electric charge of the bacteria have not given uniform results, but it is worthy of note that some authors consider them to be electropositive. On the other hand, Bechhold has recently shown certain ferments to be electronegative.

(*b*) A different view from that of Bail was first pronounced by Kabeshima. According to him, bacteriophage action is merely a special case of fermentative autolysis, a phenomenon long known to occur in many bacterial cultures. With this hypothesis the phage would be a catalyser, which, on addition to certain bacteria, activates the pro-ferment of the autolytic ferment normally contained in them; the bacteria undergo dissolution, whereupon the catalyser again becomes free and activates the pro-ferment of other bacteria in the culture, and so on, until the available bacteria have all become dissolved. On the face of it, this hypothesis would seem very plausible, but one objection at once arises, it is a question of *quantity*. It has been indicated that from a small, almost infinitesimal amount of the phage one can obtain, by repeated passages in broth-cultures of the corresponding bacterium, any amount of the phage; if now the catalyser is an "outside" substance, this would not seem feasible. One would have to make the further assumption that the catalyser was also derived from the bacteria. But if both catalyser and pro-ferment are contained in the bacteria, then why are the bacteria not always and normally dissolved? Obviously, one would have to imagine a further hypothetic substance, a "catalyser to the catalyser," and thus there would be no end to these complications, we find ourselves reduced *ad absurdum*. Apart from this objection, however, the ferment hypothesis of bacteriophagy fits in well with several other facts, as will be shown further on.

(2) IS THE PHAGE DERIVED FROM THE HUMAN (OR ANIMAL) HOST?

Bacteriophagy is a disease of the bacteria, inherited from generation to generation. Is this disease an infective or a constitutional one? Bordet believes the disease to originate from antagonistic substances of the host, possibly of leucocytic origin; his theory is briefly summed up in the name given by him to the phenomenon: "hereditary nutritive vitiation of the bacteria." Thus fermentative processes in the host would induce an abnormal metabolism of the bacteria; the more rapidly the bacteria grow, the more speedily would they be broken down and dissolved. Nothing is more natural than that such a disease should be inherited continuously in organisms like bacteria, which are incapable of repairing the constitution of their germinal plasma by sexual proliferation.

It has been stated by Borchardt that bacteriophagy can be set going by adding trypsin, activated by enterokinase to the bacteria; but these experiments have not been satisfactorily reproduced by others. Besides, they are not conclusive, because it is often possible to obtain the phage from the normal body, but this is far easier with filtrates of the intestinal contents than with those from the pancreas.

Still, it must be admitted that certain facts favour an hypothesis which views the phage as an inanimate ferment. Chiefly in favour of such hypothesis are the following facts:—

(*a*) The fact above mentioned, that the phage can be almost quantitatively adsorbed by certain colloids, at first sight appears more easily explicable by the ferment hypothesis than by the supposition that the phage is a living organism. But quite recently Bechhold has showed that from a broth culture of bacteria 99 per cent. of the microbes can be removed by shaking with an electronegative colloid (oxide of silica).

(*b*) It has been mentioned before that an immune serum neutralises the bacteriophage according to the "law of multiples." These relations are known to occur regularly between toxins and antitoxins, also between ferments and antiferments; but we know of no case where a microbe or its endotoxins are destroyed by the corresponding immune serum according to this law. Besides, so far as we know, such destruction is only effected by a serum in the active state—i.e., in the presence of *complement*; but the bacterio-phage is neutralised equally well by an inactivated serum (after heating for half an hour to 56° C.) as by the same serum in its active state. Thus the supposition that the phage is a living being is only tenable if we make the further assumption that its destructive action on the bacteria is the result of ferments carried or secreted by the phage.

The oft-quoted fact that disinfectants destroy the bacteriophage is explicable equally well by the ferment hypothesis as by that of d'Herelle, for all ferments are more or less injured by treatment with disinfectants. In spite of the objections here stated, a certain number of investigators, to whom I also belong, believe d'Herelle's view to be the correct one.

IS THE BACTERIOPHAGE A LIVING ULTRA-MICROBE?

The case for the ultra-microbe is not an easy one, as has been shown. How is one to prove the life of something no one has ever seen? Particulate we must assume it to be, for otherwise it is hardly possible to explain the formation of separate, localised areas denuded of bacterial growth in thinly-seeded agar cultures, nor the proportionality of these areas to the concentration of the phage.

My first endeavour was to estimate the *size* of the phage corpuscles. To this end, membrane filters of graded permeability were employed, as furnished by the firm de Haen in Göttingen. The membranes are a fraction of a millimetre in thickness and have an absolutely smooth surface; thus their power of absorption, as was shown in control experiments, is extremely low, so that a reduction of the strength of the phage when filtered through these membranes must be attributed not to absorption, but solely to the relation between the size of the pores and the diameter of the phage corpuscles. Whilst the finest

filters retained the phage, and the most porous ones let it pass almost without loss, a certain intermediate grade reduced the power of the phage considerably. Bechhold gives the following sequence of size of colloidal substances:—

Decreasing
- Collargol 20 μμ.
- Colloidal gold 1–4 μμ.
- 1 per cent. gelatin solution.
- 1 per cent. hæmoglobin solution (mol. weight about 16,000).
- Serum albumin (mol. weight 5000 to 15,000).

In my experiments the filters which partially arrested the phage also arrested collargol in about the same proportion, whilst allowing the practically unreduced passage of 1 per cent. gelatin solution, 1 per cent. hæmoglobin solution and serum albumin, as well as of pepsine, trypsin, and an invertase from yeast cells. It therefore seems permissible to estimate the size of the phage corpuscle to be somewhere near that of collargol—i.e., 20 μμ. There is good reason for believing that the micro-organisms of pathogenic filterable virus are considerably above this dimension, and only slightly below the limit of our vision; their diameter is probably between 100 and 200 μμ. *Is it possible to imagine particles of only 20 μμ to be endowed with life?*

The mass of a phage particle of 20 μμ diameter would be, assuming its density = 1, $\frac{4}{3}\pi.10^{-18}$ g. In order to estimate how many proteid molecules such a mass could contain, it shall be assumed that each molecule, presumably proteid, must contain at least 1 atom of sulphur. This weighs approximately 10^{-24} g. The amount of sulphur in bacteria has been found to be 1/100 per cent. If the chemical composition of the phage were similar, then one phage corpuscle would contain $\frac{4}{3}\pi.10^{-22}$ g. of sulphur and this would represent about 400 atoms of sulphur; thus it may be deduced that one phage corpuscle contains about 400 molecules of proteid matter. Can so minute a body be credited with the complex manifestations of life?

The chief of these manifestations—metabolism and proliferation—will not help us in the decision of this difficult question: metabolism cannot be proved to exist, since in bacteriophagal multiplication there is always simultaneously present the proliferation of the bacteria; proliferation, or what appears to be proliferation, is therefore accounted for by the ferment hypothesis as well as by the assumption that the phage is something living. But there still remain two features which, so far as is known, are absolutely characteristic of living bodies: random variability, incorrectly called "mutation," and variability in a definite direction—e.g., in overcoming noxious influences, "modification" or adaptability. It has been my main object to demonstrate both of these features in the phage.

(*a*) *Random Variability.*—From an agar plate culture presenting some distinct bacteriophagal clear areas, different areas are subcultured in tubes of broth, which have been seeded with equal numbers of bacteria; the tubes are incubated for 24 hours at 37° C., then filtered through bacterial filters. As a rule, the different subfiltrates, although derived apparently from one original phage strain, show marked differences in their behaviour towards anti-bacteriophage serum and towards disinfectants.

The neutralisation by the antiserum is measured as follows: into each one of a series of sterile test-tubes we fill 1 c.cm. of a freshly prepared emulsion of bacteria in broth, (1 c.cm. to contain about 250,000,000 bacteria). To one of these tubes we add 0·2 c.cm. of a mixture of equal parts of the phage and its antiserum in thousandfold dilution with normal saline and mix thoroughly; to a second tube also containing 1 c.cm. of the bacterial emulsion we add 0·2 c.cm. of a mixture of equal parts of the phage and normal saline; thus the latter tube serves as control to the former. From each of the two mixtures we withdraw with a calibrated capillary 0·1c.cm., blow it out on to the surface of a fresh agar plate, spread thoroughly over the surface with a glass spatula, and incubate for 24 hours at 37° C. The number of clear areas in the bacterial growth on these plates indicates the number of viable or active phage corpuscles. Since the antibacterio-phage serum neutralises at least part of the phages in the first mixture, the number of areas developing in the culture inoculated from the phage antiserum mixture must be smaller than that in the control; the ratio of these two figures indicates the titre of the antiserum.

If, now, we had originally subcultured not only one area, but several, always working under exactly the same conditions with broth and agar of the same date of making, then we find the titre to show marked, sometimes very pronounced, differences for the different substrains of phage. Similarly, this difference is at least equally marked, if we treat the phage not with antiserum, but with some disinfectant, the technique otherwise being the same.

(*b*) *Variability in a Definite Direction.*—It is a well-known fact that bacteria can be accustomed, by repeated passages through weak concentrations of certain disinfectants, to grow in the presence of concentrations of this disinfectant, which at the outset would have killed them—e.g., *B. coli* in phenol. It was my aim in like manner to accustom the bacterio-phage to disinfectants. Thus, mixtures of equal parts of a phage and of sublimate solution 1 : 10,000 were kept at room temperature in the dark for a day, then seeded on an emulsion of 250 million bacteria per c.cm. of broth and spread on the surface of an agar plate as described before. Some of the clear areas developing on the agar were picked off, inoculated into fresh bacterial broth culture, incubated, and after complete lysis had occurred, were filtered. The strains of phage thus obtained may be called "sublimate passage strains"; of each of these one part was again mixed with equal parts of sublimate 1 : 10,000, another part, serving as control, was similarly diluted with normal saline. The mixtures were kept in the dark at room temperature for a day; then from each of them 0·1 c.cm. was transferred to 1 c.cm. of fresh bacterial broth emulsion, and 0·1 c.cm. of this mixture was at once spread over the surface of fresh agar plates in the manner described before. The proportion of areas developing in each pair of agar plates indicates the destructive action of the sublimate on the phage, or, in other words, the resistance of the particular passage strain to sublimate. From these agar plates some of the areas were again picked off, and thus a second series of passage strains was obtained, which was again mixed with sublimate and treated further, as described for the first series. After nine such passages, the number of phage areas on the agar plate inoculated from the sublimate-treated phage and from the control was approximately equal, thus showing almost complete resistance to sublimate to have developed in the sublimate passage strain. Yet the original phage strain, carried on for an equal number of passages without contact with sublimate, showed complete destruction by the same sublimate concentration. Thus it has been proved that the phage can be completely accustomed to certain concentrations of sublimate, which at the outset had sufficed to destroy it.

Similar experiments were carried out with phenol. The thirty-third passage in phenol was destroyed in two days by phenol 1·9 per cent., the control strain of phage, which had never come in contact with phenol, was destroyed by phenol 1·5 per cent. Analogous results were obtained with a very efficient disinfectant called chloramine (para-toluol-sulfone-chloramide-sodium).

This would appear to be conclusive proof that we can accustom the phage to the deleterious influence of certain disinfectants. Similar results have been published by d'Herelle for the resistance of the phage to acids, but they are not quite conclusive; more exact data in the same direction were since obtained by Asheshov, Schuurmann and for some, but not all, the phage strains examined by Ordelt.

Yet the critic may still raise two objections against the assumption that these results prove the phage to have been really *accustomed* to the disinfectant.

(*a*) It may be affirmed that it is not the phage which varies, but the bacteria; indeed, we know such

variations to occur regularly in bacteria, as in all living organisms. But this contention is not very plausible; for it should be remembered that—e.g., on an agar plate covered with bacteria and showing 100 phage areas, the original implant of the plate would have been only 100 phage corpuscles, but 25,000,000 bacteria. If, as we have seen, differences are found in the behaviour of the individual phage areas, it is surely far-fetched to attribute them to plus- or minus-variation of the bacteria, whose enormous number must tend to equalise such effects. They *must* be attributed to variation in the phage corpuscles.

(*b*) But even assuming this to be true, there arises the further objection that in the filtrate originally employed there might have been present two or more different *species* of phage; perhaps in our endeavour to accustom the phage to an antiseptic we have only weeded out the less resistant kind and retained the highly resistant ones. Bail has indeed shown that in a freshly isolated "raw" phage filtrate there may often be present two or more substrains; they can sometimes be distinguished by the size of the phage areas on agar; by repeated subcultures from one kind of area he succeeded in separating a number of such substrains. In order to invalidate this last objection, I carried out the same experiments with one of these "ultra-pure" substrains, kindly sent me by Prof. Bail, the strain called "Lauda G," which forms characteristic very large areas.

With this pure-line strain virtually the same results were obtained: great variation in the resistance of different passage substrains to chloramine, and after about 30 passages a definite increase of each of them, and therefore also of the average resistance of the passage strains to this antiseptic, as compared with the original strain untreated with chloramine. It is true, after the thirty-eighth passage the resistance of the passage strain again became equal to that of the original strain, but such occurrences are known to occur with bacteria and higher organisms also.

Therefore I believe to have proved the variability of different kinds of the bacteriophage, and the possibility of accustoming them to the noxious effects of certain disinfectants. So far as I can see, these facts allow of no more plausible explanation than that the bacteriophage is a living organism.

WERTHEIM'S HYSTERECTOMY FOR CARCINOMA OF THE CERVIX.

THE RESULTS OF SEVENTY-SIX HYSTERECTOMIES PERFORMED FIVE OR MORE YEARS AGO.

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EVERY new treatment for cancer is hailed with delight and great results claimed for it. Naturally, when these great expectations fail to be realised reaction sets in, but later, if there is any benefit at all obtained from the treatment, the pendulum again swings a little forward and finally, after several years of trial, we are able to assess its true value.

For over 20 years Wertheim's hysterectomy has been performed in this country, and the time has now arrived when we should be able to assess its value and decide whether it has stood the test of time. When it was first introduced it was received with a good deal of silent opposition on the part of many of the older gynæcologists, but some of the younger members took it up enthusiastically though, in a little time, the inherent difficulties of the operation cooled a good deal of the enthusiasm. The difficulties in those days seemed very much greater than they are to-day. Each operation presented some fresh obstacle. What had been found in the last case we were prepared to meet again, and we took precautions against it, but inevitably something fresh appeared and each operation became an adventurous voyage in an uncharted ocean. It was at this stage Comyns Berkeley and Victor Bonney did so much to rescue the operation when they published a long series of cases with a mortality no more than was justified by the great benefit conferred. Moreover, by working together they obtained a large number of cases for operation and so were able to chart most of the common difficulties which were encountered. Other gynæcologists who were doing the operation flocked to see their perfected technique, and soon the operation was being more generally performed on more or less identical lines. The younger gynæcologists who have commenced to do the operation within the last ten years cannot realise the enormous difficulties which confronted the earlier operators, so many of these difficulties having been removed as the operation has become standardised.

These earlier recorded benefits due to the operation have now been supplemented by a further paper by Mr. Victor Bonney,[1] who gives details of all the cases upon whom he has operated more than five years ago, 214 altogether. The total mortality is about 15 per cent., but in his later series he has reduced this to 12 per cent. Of the total number operated upon, 85, which is just below 40 per cent., were alive and well at the end of five years. These are brilliant results, and must go a long way definitely to establish the operation as the treatment most likely to hold out a chance of permanent cure. The criticism on the paper is likely to be: "These are the results in the hands of one brilliant operator, and it is not likely they will be equalled if the operation becomes more generally performed." It is, therefore, the duty of every gynæcologist who has a considerable series of cases performed more than five years ago to publish his figures with the same honesty as Mr. Victor Bonney, and without any excuse for those who have died of intercurrent disease or whose future history has not been followed, and it is most essential that every operator should keep a complete follow up of all his cases. It is for this reason that I now publish the results of the cases upon whom I have performed this operation more than five years ago, 76 altogether. The figures of these 76 cases are as follows:—

Deaths due to operation	16 (21	per cent.)
Recurrences	25 (33	,,)
Deaths from other causes	2 (2·6	,,)
Untraced	3 (3·8	,,)
Alive and well five years after the operation	30 (39·5	,,

Operability.

This is one of the least important figures as the percentage must vary very considerably with the type of work which the operator is doing. The young gynæcologist in charge of a large out-patient department will naturally see more of the very advanced inoperable cases than will the more senior man in charge of a large number of beds with no out-patient department. Nevertheless, although it is not an important figure and must vary considerably with different operators, still it does give some indication of the type of case he is operating upon, and will divide surgeons roughly into two classes, the one who operates upon every case where there is a reasonable chance of removing the growth, and the others who merely choose a very small number of early cases for the operation. In a previous paper[2] I gave my operability rate as 26·8 per cent., but this figure was based on a record of only six months' work. Since that time I have kept a very careful record of every case of carcinoma of the cervix which I have seen, and the number I have operated upon, and I find in the last five years my operability rate works out at 53 per cent. This figure is less than the rate quoted by Victor Bonney, 63 per cent., but is sufficiently near to show that I am operating upon the same class

of case, and give every patient with this disease a chance of the operation if it is at all practicable.

Operation Mortality.

In this series my operation mortality is almost the same as Bonney's for his first 100 cases, though in his later series he has improved this to 12 per cent. At first sight this seems a dreadfully high figure, and it is one which could be easily improved if the cases were carefully chosen, but, in a disease of this nature where, up to now, no other form of treatment holds out anything like such a good chance of cure, it is the duty of the surgeon who does the operation frequently to give each of these otherwise condemned patients a chance, and he should not refuse to operate upon any with a reasonable chance merely because he thinks it will worsen his own statistics. At the present state of our knowledge, apart from this method of treatment, patients with carcinoma of the cervix have very little chance of cure, and if we save only a small percentage of these very advanced cases the mortality is fully justified, as many of them which do recur have a considerable interval of freedom of symptoms and those who die would otherwise have only a short and miserable existence. It should be emphasised that this operation is the most difficult one which the gynæcological surgeon is called upon to perform, and should only be practised by those who are constantly operating and have the opportunity of performing this operation frequently and so perfecting their technique. It is not an operation for a man whose operative work is only part of his daily life, and who is likely only to perform this operation a very few times. The chief cause of death is shock, and the wider the operation is taken the greater the mortality. After shock I find sepsis of the rawed pelvic tissue, and sepsis of the urinary tract, the most common causes of death.

Sepsis of the urinary tract is very difficult to combat. After such a severe operation patients frequently have retention of urine with the necessity of catheterisation, and no matter how carefully this is done there is the liability of bladder infection, as this organ is less resistant after so much damage to its nerve-supply. In a few cases the septic infection tracks up to the kidneys. For some time I have given my patients urotropine, gr. 40, for a few nights before and after operation, but whether this is a real benefit or not it is difficult to determine.

Occasionally we see a case where the growth is obviously very early and the uterus freely movable, but more often the advanced case where the growth has extended on to the bladder wall and the uterus is fixed in the pelvis, and between these is a large number of cases where it is doubtful whether the whole growth can be removed or not. These are cases in which the operation should be given a trial, though necessarily a number will be found so advanced that the abdomen will have to be closed without the operation being completed. In my experience the duration of the symptoms is of little value in determining whether the case will be operable or not. Some with a very short history prove to have a very advanced, inoperable growth. Pain is a most important symptom, and I doubt whether it is ever possible completely to eradicate the growth when once this symptom is established. The cauliflower type of growth which forms a big mass in the vagina is much more favourable than the type which shows very little growth on the cervix but extends upwards in the upper cervical tissues. A growth on to the bladder I consider quite inoperable, and never perform an extensive operation which requires removal of the bladder wall. The thickness of the patient's abdominal wall is another important factor in determining operability. The old teaching was that malignant disease of the cervix occurs in poor, worn-out, thin, anæmic patients, but in my experience some of the fattest patients I have been asked to operate upon have suffered from this disease. A fat abdominal wall, with masses of fat in the bladder wall and pelvis, makes the operation extremely difficult, and I have more frequently abandoned the operation for this reason than because of the extent of the actual growth.

Operation.

The operation, nowadays, is more or less standardised, but I think we should insist upon the term "Wertheim's hysterectomy" being applied only to those cases in which the ureters have been dissected out and the vagina clamped over the growth before removal. There are still certain operators who say they are doing Wertheim's operation, where, in reality, they are only doing a simple pan-hysterectomy, and it is not fair to compare their results with those who are doing a complete Wertheim's hysterectomy.

Glands.

Many operators lay great stress upon the prevalence of malignant infection of the glands. In my experience the glands are involved very much less frequently than one would expect. Even where the glands are enlarged microscopical investigation shows it is frequently due to septic infection, not to malignant deposits. In his series of 214 cases Bonney found the large number of 43·4 per cent. to have malignant glands, and by carefully compiled tables he shows that this group have a much greater primary mortality and a much higher percentage of recurrence than those without glandular involvement.

Recurrence.

This is the chief test of the operation, and in my experience the majority of recurrences occur in the first or second year. Of all my cases which have suffered from recurrence 81 per cent. have done so in the first two years. If at the end of one year after the operation the patient is perfectly fit and well, putting on weight, and has a good colour, I consider she has a good chance of remaining perfectly free. If, on the other hand, she is rather seedy, with a bad colour, I feel that recurrence will probably take place during the next 12 months, but we must remember that no period of freedom from recurrence warrants us to use the word cure. For some time, five years has been taken as the period which some operators consider as justifying the use of the term, but only last month I heard of two of my patients, one of whom has been perfectly well for nine years, and the other for six years, and now both have recurrence.

Of the cases upon which I performed the operation more than five years ago, there are 76. Of these, 16 died of the operation, 25 have died from or are suffering from recurrence, two have died from other causes (one an operation upon the ureter two years later, and one from tuberculous meningitis four years later), and three cannot be traced. This leaves 30 alive and well at the end of five years, being 39·5 per cent. of those operated upon.

Of cases operated upon more than seven years ago, I have 50 with the following results:—

Immediate death	11
Recurrence	18
Death from tubercle	1
Not traced	4
Alive and well after seven years	16 (32 per cent.)

It would be a simple matter to improve this figure by deducting cases which died from intercurrent disease, cases which cannot be traced, &c., but as the ground for decision whether the operation is justified or not I think the only figures which should be allowed are the total number of cases upon which the operation was completed, and the number of cases which are alive and well after five years. In my case I performed the operation in 76 patients, and of these 30 are alive and well, and so, although I am appalled with the dreadful mortality, I feel compelled to proceed with this operation until some other form of treatment is

definitely proved to be capable of giving a freedom of recurrence over five years to 40 per cent. of the patients to whom such treatment is applied.

Radium.

The chief alternative treatment to operation for carcinoma of the cervix is radium, about which a large literature has sprung up. The application of radium is fairly straightforward, and does not require anything like the technical skill that is necessary for a Wertheim's hysterectomy, and so the difference in results due to this personal factor should be eliminated; in fact the technique employed at the "Radiumhemmet" in Stockholm, from which some of the best results have been published, is one of the simplest. It is therefore very surprising to find such enormous differences in the results published by the various observers. Heyman,[3] from Stockholm, claims 20·29 per cent. of all his cases to be alive after five years and 40·5 per cent. of his operable cases, while Gray Ward [4 5] and Farrar claim 23·6 per cent. of all cases and 52·9 per cent. of the operable cases to be alive after five years.

If these figures can be equalled in other countries then Wertheim's hysterectomy should be abandoned. It is very difficult to criticise figures from other countries but, whilst these observers are absolutely reliable and their figures above suspicion, there may be other factors which we, in other countries, cannot assess. For practical purposes we must remember we are treating cases of carcinoma of the cervix in our own country. We have been using radium extensively for many years, and until our own radiologists can show figures comparable to these we must continue to perform Wertheim's hysterectomy. In Manchester we have had radium used in these cases for 13 years, but so far no extensive figures have been published; and in assessing its value I have to rely upon my own impression of the results on my own cases. Naturally, most of the cases referred to the radiologist are advanced ones, but occasionally an early operable case is sent to them because the patient is suffering from some other condition which precludes operation, but up to the present time I have not found any of these patients free from recurrence at the end of five years.

Some years ago I was very interested in cases which had been made operable by radium, and in 1919 read a paper[6] before the Obstetrical Section of the Royal Society of Medicine along with Dr. A. Burrows, based upon 11 cases. So impressed was I with the effect of radium that, from that time, I made a general rule of having each case of carcinoma of the cervix treated with radium before the operation was performed. I did this after careful consultation and discussion with Dr. Burrows, the radiologist, who felt that radium would act as well before the operation as after, and would give very much less likelihood of fistula and other pelvic troubles.

Of the patients upon whom I operated more than one year ago I find 68 were treated with radium previous to the operation and in 59 radium was not used at all. Of the 68 cases treated with radium, 28 are alive and well to-day—that is 41 per cent.; whereas of the 59 not treated by radium only 18 are alive—that is 32 per cent.

Now that we know more about the action of radium and see how localised it really is, it is difficult to understand how the rays will affect the tissues beyond the line of operation, and lately I have tended to discard the use of radium, but now that I have taken out these figures and find such a considerable difference in the results I feel that probably radium has been of some benefit and it should be given an extended trial to our operation cases.

References.

1. Proc. Roy. Soc. Med., Obst. Sec., December, 1926, p. 120. 2. Brit. Med. Jour., 1921, ii., 1101. 3. Jour. of Obst. and Gyn. Brit. Emp., 1924, xxxi., 1. 4. Amer. Jour. of Obst. and Gyn., 1926, xi., 439. 5. Amer. Jour. of Amer. Med. Assoc., 1925, lxxxv., 159. 6. Proc. Roy. Soc. Med., Obst. Sec., 1920, xiii., 191.

THE BLOOD PRESSURE IN PSYCHONEUROSIS.

AN INVESTIGATION OF 71 CASES.

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SINCE the days when John Hunter said that his life was in the hands of any rascal who chose to annoy him, the influence of the emotions upon the circulatory system has been constantly—though somewhat vaguely—recognised. Whereas knowledge of the mechanical factors concerned in blood pressure has reached quite formidable proportions, the reaction of that mechanism to stimuli of psychical origin has received a comparatively small degree of exact observation. So far as the psychoses and psychoneuroses are concerned, definite findings have been established, the consensus of opinion being as follows. In the psychoses, according to Sir Maurice Craig's investigation,[1] the blood pressure is variable, being higher than the normal in cases of melancholia and the depressed types of manic-depressive insanity, but subnormal in states of mania and agitated melancholia. In the psychoneuroses, neurasthenias, psychasthenias, Craig, in common with other observers, has found the blood pressure to be low. Halls Dally [2] has laid stress upon the rise of pressure occurring in a group of cases in which there is a marked degree of anxiety neurosis, or history of prolonged mental strain. He also refers to the temporary pressor influence exerted by such emotions as fear, anger, or states of worry and great mental activity. The latter aspect of the subject has been investigated in detail by Cannon,[3] to whose work further reference will be made.

Aims and Definitions.

In the present investigation an attempt has been made, first, to compare results with the above findings; second, to examine in greater detail the cases of neurosis in which an abnormally high blood pressure occurs; third, to observe the result of treatment in such cases; and fourth, to investigate the temporary response of the circulatory system to states of increased emotional tone. The cases were not selected, but represent a series to which the same methods of investigation, precautions, and technique were applied. The term neurasthenia has not been taken to include psychasthenia, but rather to denote that state in which the symptomatology is physical rather than mental, associated with a host of subjective symptoms both general, such as the asthenia, and local, in which the symptoms are referred to any or all of the systems of the body. Psychasthenia, on the other hand, has been taken to include that type of case wherein no physical symptoms are evident, but where the complaint is of an asthenic mental state—defective memory, lack of concentrating power, phobias, and obsessions — the reasoning power remaining unimpaired. The two types are, of course, commonly present in the same patient, but in the early stages often appear as distinct entities.

Method, Technique, and Precautions.

To eliminate organic ætiological factors the following measures have been adopted in each case. Thorough physical examination, neurological, cardiovascular, genito-urinary, &c., was undertaken. Investigation as to the patient's life and habits, age with reference to menopause, and as to the possible existence of some septic focus, anæmia, &c. In the majority of cases, too, the patients had been submitted to thorough examination before coming under investigation. Forty-one of the cases were males, and 30 females. With the exception of one patient aged 63, all the ages were between 20 and 60 years.

The technique and method observed were as follows. The instrument used was of the Martin type with a

mercurial manometer, and the readings were taken by the auditory method and checked digitally. The pulse-rate, the systolic and diastolic pressures were recorded on each occasion. Each reading was taken after the patient had rested for at least 10 minutes in a comfortable chair, and every possible psychical disturbance had been brought to an irreducible minimum. In cases where the pressure was found to be high upon first reading, it was recorded again 10 minutes later, the emotional response—a term which will be further explained—being observed and excluded. The accuracy of the latter reading as a record of the patient's blood pressure was confirmed by readings taken a few minutes later. Readings were taken upon subsequent occasions, always at the same time of day.

The precautions taken have been practically those advocated by Halls Dally; his formula, too, has been used in working out a scale of normal blood pressures, a latitude of 10 mm. Hg above and below this scale of pressures being allowed in order to give generous interpretation to the expression "normal limits." According to these formulæ the standard systolic pressure between the ages of 20 and 60 equals 120 + 1/5 of the age. At the age 60 the standard systolic pressure is taken as 135, and for each year above this, up to and including age 80, add 1 mm. Hg. For diastolic pressure 80 mm. Hg is taken as standard for 20 years of age, adding 1 mm. Hg for each 5 years up to 60, and 2 mm. Hg for each 5 years between 60 and 80.

Blood Pressure in Neurasthenia and Psychasthenia.

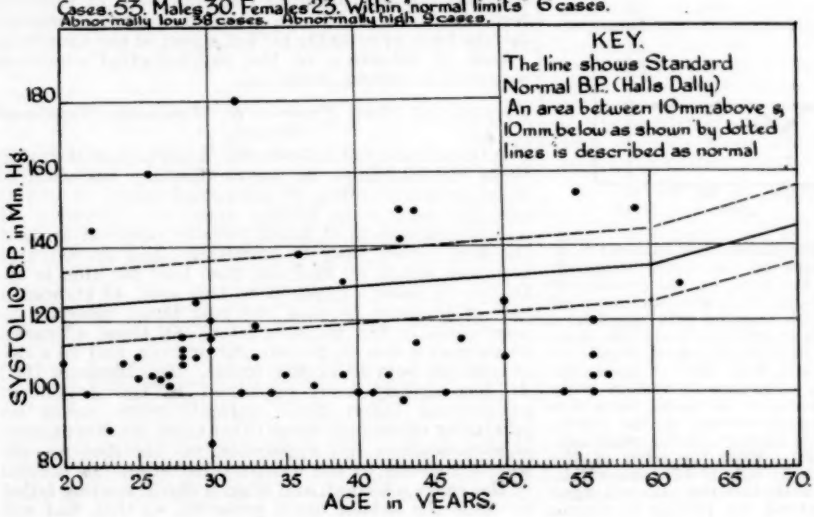
To turn to the actual findings, the results of investigation on the cases of neurasthenia and psychasthenia confirm the findings of other observers to the extent illustrated in Diagram I. (Table I.). It will be seen here that in the majority of cases (84·9 per cent.) the systolic blood pressure readings are found to be below normal, some of them to a marked degree. It is interesting to note that a number of the patients who exhibit pronounced hypotonus are those who show the symptoms and signs of circulatory instability. Such a patient will complain that some slight shock, excitement, self-consciousness, or other emotional stimulus is followed by "thudding" of his heart or carotid vessels, or by the consciousness of his pulse-beat in limbs, ears, or head. With these is associated a feeling of warmth and many other subjective sensations. On examination the skin is found to flush readily and to exhibit dermatographia, the heart sounds are abnormally loud and clear, the pulse is full and bounding, almost of a collapsing quality, though not necessarily increased in rate. Obvious pulsation is observed in the larger arteries such as the abdominal aorta and the carotids. The condition is well demonstrated in several cases of the present series, as, for example:—

TABLE I.—(*See Diagram I.*) *B.P. in Neurasthenia and Psychasthenia.*

	No.	Age.	Sex.	Diagnosis.	B.P. S.	B.P. D.	P.
Abnormally high	5	39	M.	P.	130	80	60
	9	32	M.	N. & P.	186	80	82
	11	26	M.	N. & P.	160	100	80
	12	22	M.	P.	145	95	72
	14	59	F.	N. & P.	150	110	100
	41	44	F.	P.	150	90	104
	46	43	F.	P.	142	90	66
	47	36	F.	P.	138	—	72
	67	55	M.	N. & P.	155	90	78
	1	30	M.	N.	86	55	70
	2	29	M.	P.	125	88	78
	3	26	M.	P. & N.	104	60	66
	4	37	M.	N.	102	70	90
	6	25	M.	P. & N.	104	68	72
	10	63	F.	N.	130	70	80
	13	24	F.	N.	108	82	72
	15	56	M.	N. & P.	110	60	72
	21	20	M.	N.	108	65	60
	22	54	M.	N. & P.	100	60	60
	23	50	F.	N. & P.	125	90	78
	26	39	M.	P.	105	70	72
	27	30	M.	P.	115	85	72
	28	28	F.	N.	115	70	84
	30	56	F.	P.	120	70	84
	32	28	M.	P.	110	60	68
	33	56	M.	N.	100	80	80
	34	33	F.	N.	110	190	72
	37	43	F.	N.	98	65	90
	38	27	F.	N. & P.	105	75	88
	39	28	F.	N.	108	80	84
	42	26	M.	N. & P.	105	70	60
	43	33	F.	N.	118	80	70
	45	27	M.	N.	102	70	64
	51	44	M.	N.	115	85	72
	52	57	F.	N.	105	84	72
	53	35	M.	N.	105	83	72
	54	29	F.	N. & P.	110	88	50
	55	25	F.	N. & P.	110	—	—
	56	47	F.	P.	115	82	72
	57	41	F.	P.	100	70	72
	58	42	F.	P.	105	72	72
	59	23	M.	N.	90	70	60
	60	46	M.	N.	100	70	56
	62	56	F.	N.	105	75	74
	64	30	F.	N.	120	90	80
	65	28	M.	N.	110	—	120
	66	32	M.	N.	100	73	90
	68	50	F.	N. & P.	110	60	78
	69	22	M.	N.	100	74	60
	70	40	M.	N. & P.	100	58	72
	71	30	M.	N. & P.	112	58	72

Cases, 53. Males, 30. Females, 23.
Above normal = 10 = 15·1 %. Below normal = 43 = 84·9 %.

DIAGRAM I (See Table I)



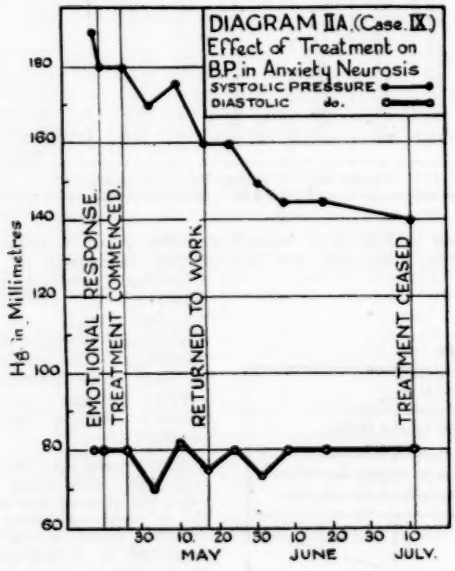
A. M., male, aged 30. The condition dated from 1916, when the patient was buried by a shell explosion and suffered from a condition described as "shell-shock," on account of which he was invalided out of the army. He had been able to work for short periods only since that time. When first seen his main complaints were of exhaustion, lassitude, sweating, palpitation, choking sensations, restlessness, and insomnia. The slightest mental excitement or activity, such as might occur from conversation, reading, or being examined, served to exaggerate enormously the cardiovascular activity, and to produce the symptoms

subjective sensations, and signs already described. Physical examination discovered no organic lesion, the response to physical effort was good, the pulse-rate during the occurrence of symptoms was not accelerated, but remained at 70 per minute. The blood pressure in this case was 86/55.

High Blood Pressure in Anxiety Neurosis.

Reference has already been made to a definite group of cases of psychasthenias and anxiety neuroses in which an abnormally high blood pressure occurs. There are 13 such cases in the present series. (See Table II.) This condition is usually associated with anxiety neurosis in some form, and is one in which some worry, fear, or distressing idea continually dominates the patient's thoughts and renders him in a state of continued anxiety and suppressed excitement. The actual cause for anxiety may have no foundation in fact but recurs again and again to the patient's mind because of its painful character. Such an idea gradually absorbs more and more of his attention until a vicious circle is established. The mental preoccupation not only leads to lack of concentrating power and inability for work, but itself causes exhaustion far more quickly than normal mental activity. Mental depression or agitation follows, possibly complicated by insomnia, until at length the patient begins to complain of physical symptoms such as those seen in neurasthenia. On the other hand, the anxiety state may be founded on fact but be out of all proportion to the original cause. A minor business worry may be magnified into impending bankruptcy, or a chance remark into an intended insult.

It is interesting to note too, how, if the condition is treated and the mental state becomes calmer and more normal, the blood pressure falls to within normal limits as in Case 9. Diagram IIA. (Table II.)



This was a man, aged 32, who dated his symptoms from active service in France where he was twice wounded. Although not removed from the front on the grounds of "shell-shock," he gradually began to notice the onset of self-consciousness and depression together with circulatory signs and symptoms as already described. When first seen, eight years after the onset, he complained of dreads of suicide, homicide, and insanity, and also of numerous subjective sensations, tingling sensations in various parts of the body, pressure on the vertex of the head, pains of a wandering character, shooting sensations in the limbs. As seen in the diagram the blood pressure at the commencement of treatment was 180/80. With the relief of the mental condition the figure steadily fell until it came within normal limits. Concurrently with this the physical signs and symptoms cleared up enabling the patient to resume work as a gardener. Six months later his doctor reported that he remained at work and in normal health.

As illustrated, the blood pressure in each case approximated to the normal concurrently with the return to a more peaceful state of mind.

Sir Humphry Rolleston [4] has indicated the importance of ascertaining a possible psychological

TABLE II.—*Effect of Treatment on B.P. in the Anxiety Neuroses.*

Case No.	Age.	Sex.	B.P. Before treatment.		B.P. After treatment.		Syst. Diff.
9	32	M.	180/80	82	138/75	72	42
11	26	M.	160/100	80	132/85	66	28
12	22	M.	145/95	72	118/64	72	27
14	59	F.	180/110	100	145/100	100	35
16	44	M.	150/105	88	N.R.	—	—
17	26	M.	145/100	78	126/82	66	19
41	44	F.	150/90	104	138/90	93	12
46	43	F.	148/78	72	120/70	70	28
47	36	F.	148/82	84	120/75	66	28
49	37	M.	160/120	72	118/80	60	42
61	43	M.	150/90	70	125/75	72	25
63	30	F.	145/100	72	122/95	76	23
67	55	M.	170/90	78	125/90	72	45

N.R. = Not recorded.

The "Before treatment" readings were ascertained by taking the blood pressure several times on different days in order to eliminate emotional variations.

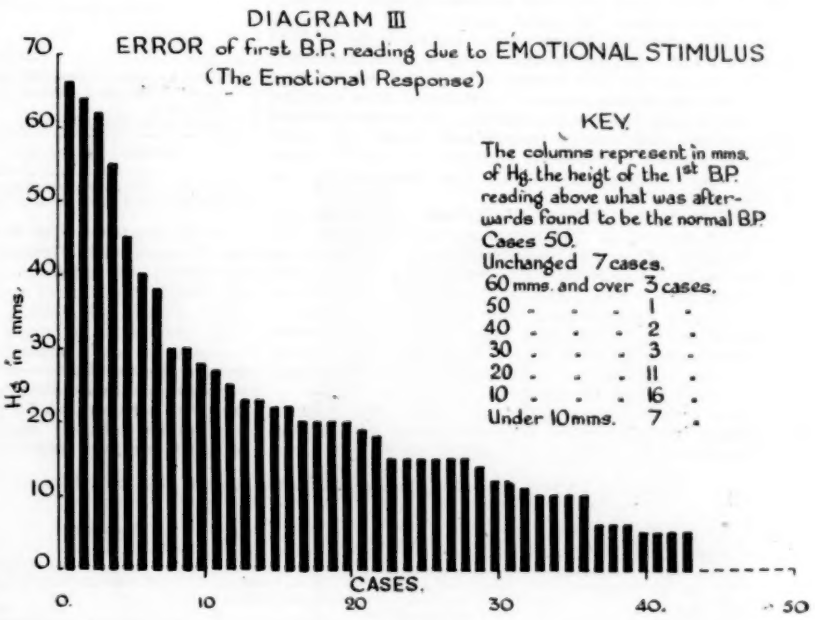
factor in cases of high blood pressure, and the conclusion pointed by the study of these cases—namely, the apparent association between the blood pressure and increased emotional tone—may conceivably throw some light upon the ætiology of hypertonus, and on those cardiovascular conditions, in the causation of which mental strain has acted as a contributory factor. According to Halls Dally, states of "continued worry and anxiety have a strong action in promoting vasoconstriction over long periods of time, tending ultimately to permanent thickening of the vessel walls." It would appear, therefore, that psychical factors are worthy of consideration in the ætiology and treatment of such conditions. From the therapeutic point of view an attempt has been made to show the value of combating the mental condition in the type of case described above. Ziegler and Levine [5] have recorded an increase in the basal metabolic rate resulting from emocional stimuli, an increase which was accentuated in psychoneurotics. They also noted the changes in the colour of the skin, the fine tremors, differences in the rate and amplitude of respiration, &c. They used these observations to show that lying still in bed was no very accurate criterion even of physical rest. So in the treatment of hypertonus where mental factors have apparently played a part in the causation—lack of attention to the psychological condition would be a serious omission.

Response of Blood Pressure to Momentary Emotional Stimuli.

A third feature of interest which has appeared during these investigations is the momentary variation of blood pressure—often to abnormal limits—which is seen following some sudden emotional stimulus. It is a commonplace of blood pressure observation that the first record may be unreliable, and an attempt has been made to find out just how far this is so. Of the 50 cases examined to this end, 43 showed a rise of pressure beyond the real blood pressure as ascertained a few minutes later. Of these 43 cases, 35 showed a rise of 10 mm. Hg or over, and 13 a rise of pressure beyond normal limits. (See Diagram III.) As has already been explained in the details of precautions taken these patients were under no particular emotional stress other than the strangeness of surroundings and apparatus, yet the first records were erroneous to the extent illustrated. In several of the cases a second, and even a third, reading failed to elicit the actual blood pressure, so that had not

great care been taken the observer would have been widely misled as to the exact state of tonus.

Without going into more wearisome analysis of the figures in all the cases, the unreliability of blood pressure readings in neurotic or merely highly strung temperamental patients is clearly demonstrated. A single record of blood pressure taken during the physical examination of such a patient is scarcely likely to prove accurate, for, though to all intents and purposes he may be at rest, his state of mental excitement, however slight in degree, may cause sufficient circulatory change to produce inaccuracy. The results also show the cardiovascular system as a sensitive indicator responding to mental processes which result from environmental stimuli, of mild degree, occurring in the absence of physical activity. The practical point arising from these temporary abnormalities of blood pressure is in cases where great stress is laid upon the record of blood pressure. In recent years, possibly to a greater extent in America than in this country, the estimation of blood pressure has played an increasing part in medical examination, especially that for life assurance, and it is conceivable that by temporarily raising the blood pressure the emotional factor might contribute to a pessimistic estimate of the patient's condition unless elaborate precautions were taken. Again, a consideration of the emotional variations in blood pressure may assist the physician to regard warily records of treatment by preparations which are credited with lowering the blood pressures some 10 or 20 mm. Hg. This emotional response would appear to illustrate the way in which high pressures of the more persistent type, like those already described, occur, and which fall, only with relief of the emotional stress. Turning to explanation of these phenomena—the sudden emotional variation and the high pressure of longer duration seen in anxiety neuroses—much help may be derived from the work of Cannon. Cannon has shown that an increase of adrenalin in the circulating blood follows increase of emotional tone, as in fear, anger, &c. He ascribes the activity of the suprarenals to the general sympathetic stimulation which occurs and which shows itself in numerous other ways such as dilation of the pupils, vaso-constriction, activity of the sweat glands, &c. The effect of adrenalin itself, however, is to stimulate sympathetic action, so that possibly thereby a double influence is brought to bear—direct and immediate sympathetic activity resulting from increased emotional tone, and indirectly produced sympathetic activity resulting from discharge of adrenalin into the circulation. Some combination of these factors, then, may account for the temporary rise in blood pressure which follows emotional stimulation. With regard to the more persistent form of high pressure found in the anxiety neurosis, it is possible that, as has been already hinted, the vicious circling of the patient's mental processes causes a continuous emotional stress, the factors just described exerting a more chronic effect upon the circulatory system—the "continued vaso-constriction" of Halls Dally. Such an explanation, too, might throw some light on the question of high blood pressure in cases where, without the occurrence of any neurosis or cardiovascular disease, a life of continued mental stress and anxiety appears the sole ætiological factor.



Summary and Conclusions.

To summarise the conclusions pointed by this investigation. (*a*) As was found by previous observers, the blood pressure in neurasthenia and psychasthenia is abnormally low. (*b*) In cases of prolonged mental strain or anxiety neurosis, and in a small group of psychasthenics, the blood pressure may be abnormally and persistently high. (*c*) The blood pressure where abnormally high falls to within normal limits as the mental condition yields to treatment. (*d*) The initial blood pressure readings in highly strung or neurotic patients may appear to be higher than is actually the case even to the point of considerable abnormality. The sudden rise of pressure is excited by some extraneous stimulus to the emotions, thence directly through the sympathetic system, or indirectly by sympathetic system and adrenal glands, to the vaso-motor system. It is possible that continued emotional stress causing frequent or continuous vaso-constriction may lead ultimately to permanent thickening of the vessel walls. (*e*) The patient's mental state plays an important part in the ætiology and treatment of hypertonus, which occurs in functional cases.

It is worthy of consideration in those more chronic cases of high blood pressure and in cardiovascular conditions which appear to result from mental strain.

References.—1. Craig, Maurice: THE LANCET, 1898, i., 1742. 2. Halls Dally, J. F.: High Blood Pressure, pp. 62, 97, 104. 3. Cannon, W. B.: Bodily Changes in Pain, Hunger, Fear, and Rage. 4. Rolleston, H. D.: THE LANCET, 1926, ii., 1203. 5. Levine, B. S.: Journal Laborat. and Clinical Med., St. Louis, viii., 775 and 73–77. 6. Craig: Psychological Medicine, 1917, pp. 262, 303.

QUEEN'S HOSPITAL, BIRMINGHAM.—The extension to the Queen's Hospital, consisting of a building containing 120 beds with three operating theatres, will be opened on Nov. 16th.

CRISIS AT SWANSEA HOSPITAL.—Swansea Hospital is in a serious financial position, having very nearly reached the limit of its overdraft of £60,000 at the bank. Unless means are found of increasing its revenue there will be no alternative but to close portions of the hospital and bring monthly expenditure into line with monthly revenue.

MENINGOCOCCAL MENINGITIS IN INFANTS AND CHILDREN.

TREATED BY FLEXNER'S SERUM.

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THE value of intrathecal infections of an efficient antiserum in meningococcal meningitis has now been generally admitted for some years.

In 1917 Simon Flexner [1] gave an analysis in 1211 cases treated with his serum, with a total mortality of 30·8 per cent. He remarks that the preparation of an efficient serum cannot be reduced to a routine, and advocates the immunisation of serum animals with other and newly recognised types of cocci, after they have been made immune to the standard types, and concurrently with the therapeutic use of their sera.

In 1917 A. G. Robb,[2] of Belfast, published the mortality figures in 300 cases occurring before the introduction of serum treatment, and of 270 cases treated with antiserum. The mortality in the first series was 72 per cent., and in the second 26 per cent. In this paper Robb stated that he had latterly used Flexner's serum only, and summarises the results in 48 cases treated with it, the total mortality being 27 per cent. The series includes nine cases in infants under 1 year of age, of whom six survived.

Neale [3] published in 1918 a series of 76 cases in infants under 1 year of age treated with serum (unspecified) with a total mortality of 50 per cent., and quotes Flexner's estimation of the pre-serum mortality, under this age, at over 90 per cent.

During the war good results were obtained by the use of polyvalent sera prepared in this country. Helen Mackay [4] published in 1920 a series of eight consecutive cases, all in children under 8 years of age, treated between September, 1916, and July, 1917, with serum from the Lister Institute. All of these survived.

Reference to the records of the Queen's Hospital for Children from 1917 to the present time, where sera produced in this country were in general use till July, 1925, shows that the results were, on the whole, disappointing. The number treated since that date with Flexner's serum is small, but the results of treatment, as far as the immediate life-saving is concerned, have been such as to suggest that Flexner's serum is worthy of a more extensive trial in this country, especially in the case of young infants.

TABLE I.

A = Analysis of 32 cases occurring in children under 14 years of age, 1917–27.
B = Twenty-one cases included in Series A, under 1 year of age.

—	A			B		
	Total.	Recovered.	Died.	Total.	Recovered.	Died.
Treated by lumbar puncture only	5	1	4	5	1	4
Treated with serum other than Flexner's	17	5	12	11	1	10
Treated with Flexner's serum ..	10	7	3	5	4	1
Total	32	14	18	21	6	15

NOTE.—The average duration of disease before treatment was begun does not vary greatly in the three groups.

It so happens that the five cases under 1 year of age treated with Flexner's serum do not include any moribund on admission. In a larger series the inevitable inclusion of a certain percentage of moribund cases would, of course, increase the mortality-rate. The exclusion of such moribund cases from the "under 1 year" series treated with other sera would reduce the mortality—if it be permissible to speak of percentages in dealing with such a small number—from 90 per cent. to 75 per cent.

A more detailed account is given in Table II. of cases under 1 year of age, treated with Flexner's serum. In Case 3 no meningococci were found on lumbar puncture, but in view of the almost inevitably fatal results of other meningeal infections leading to polymorphonuclear reactions in the cerebrospinal fluid, this case has been retained in the series. As against this, in Case 4, the meningococcal infection eventually proved, was complicated from the first by infection with a Gram-positive coccus as well.

TABLE II.—*Cases under 1 Year of Age treated with Flexner's Serum.*

Case.	Names, age, and date of admission.	Type of onset, and state on admission.	Treatment.	Result.
1	Doris K., 3 months, admitted 26/1/26.	Feverish and fretful for four days. Had fit on admission. Head retraction marked. Lumbar puncture confirmed diagnosis.	Seven lumbar punctures; 35 c.cm. serum used in all.	Temp. level 17 days from admission. Appeared normal on discharge, 24/2/26.
2	Irene G., 4 months; admitted 31/1/26.	Ill for 14 days before admission. Had two fits. Marked head retraction. Lumbar puncture confirmed diagnosis.	Four lumbar punctures; 50 c.cm. serum used in all.	Temp. level 16 days from admission. Appeared normal on discharge, 25/2/26.
3	Edward O., 10 months, admitted 29/9/26.	Onset of illness four days before admission, with vomiting. Fontanelle bulging. Lumbar puncture gave turbid fluid containing polymorphs but no organism.	Five lumbar punctures; 50 c.cm. serum used in all.	Temp. normal 10 days from admission and meningeal signs disappeared. Convalescence complicated by multiple joint effusions. Good recovery on discharge, 29/1/27.
4	Doris M., 3 months, admitted 31/12/26.	Sudden onset with vomiting day of admission. Fontanelle bulging. Lumbar puncture gave turbid fluid containing polymorphs and Gram-positive cocci.	Four lumbar punctures; 25 c.cm. serum used in all.	Died 16 days after admission. Meningococci found in later lumbar puncture as well as Gram-positive cocci.
5	Harry T., 4 months, admitted 20/2/27.	Admitted with right basal pneumonia. Chest was clear and temperature normal on sixth day. Temperature rose again, 10/3/27, and head retraction developed. Lumbar puncture, 16/3/27, gave turbid fluid containing meningococci.	Eight lumbar punctures; 90 c.cm. serum used in all.	Temp. level three days from first administration of serum. Head retraction persisted till 24/3/27. Is now making good recovery.

The Flexner serum used at the Queen's Hospital was obtained in part from the New York City Research Laboratories, E.16th Street, New York, from which address it may be had at any time on payment. Much of that used was supplied gratis by the New York State Department of Health, Albany, N.Y., on condition of a report on cases being sent. Thanks are due to this department and also to Dr. Robb of the Purdysburn Fever Hospital, Belfast, who has

[1] Jour. Amer. Med. Assoc., 1917, lxix., 639, 721, 817.
[2] Brit. Med. Jour., 1917, i., 478.
[3] Internat. Clinic, Philad., 1918, xxviii., Sect. 4.
[4] THE LANCET, 1920, i., 238.

on several occasions sent supplies of serum in emergency, when stocks were short. I am indebted to the physicians of the Queen's Hospital for permission to publish details of cases.

A CASE OF CEPHALIC TETANUS.

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TETANUS limited to the head and neck is very uncommon, and, unless one has some knowledge of the signs and symptoms which are peculiar to this form of the disease, the diagnosis is not always easy.

The subject of this report was a strong young Chinese porter who had been employed in lifting bales and boxes at a warehouse in Kuala Lumpur. He attributed his illness to an accident which had befallen him 20 days before we saw him in consultation. A box had fallen on to his head and had made a small punctured wound above the outer end of his right eyebrow, whence his friends had extracted two long splinters of wood which had been driven beneath the skin of the temple. Ten days after the accident he found that he was unable to close his right eye or to open his mouth to its full extent. A few days later he began to experience difficulty in swallowing, and was brought to the hospital by his friends with the following note: "Siew Check says he has flames in his throat and begs you to give him some medicine to overcome this trouble. Owing to this he unable to speak."

When we saw him on August 28th the wound on his forehead was completely healed, leaving a scar which is shown in the photograph taken on the same day. The face was paralysed on the same side as the wound; the right eye could not be closed, the corner of the mouth hung down, and the naso-labial fold was obliterated. The jaws were stiff and could not be separated more than half an inch. If the patient tried to open them further they closed with a snap. Sometimes, in desperation, he put his fingers in his mouth and tried to pull it open by force. The contraction appeared to be more marked on the right side than on the left. He was excited, restless, and full of terror, like a man with rabies. From time to time there was a tic-like twitching of the muscles on the left side of the face, but there was no stiffness of the neck, and the head could be turned freely. The chest and abdomen moved normally in respiration. The use of the limbs was unimpaired; the patient could use his fingers to pick up small objects, and he walked quite easily. He was able to articulate, but made us understand, by striking his throat, that it pained him to talk. He could neither cough, hawk, nor spit. On account of his distress the senses of taste, smell, and hearing were not investigated. His temperature was 102° F. in the axilla and the pulse-rate was 110 to the minute.

Such was his condition when in comparative repose, but when he attempted to swallow the result was terrible. While we were examining him he asked for some iced water, but no sooner did he put the cup to his lips than he was seized with violent spasms of the throat, jaws, and left side of the face. The small amount of fluid which had entered his mouth was shot out again with a hissing sound; short sharp hisses—like the exclamatory "hist" which is used to attract attention—followed each other at intervals of about half a second. With each hiss the head was jerked forward by a spasm of the sternomastoids, and sometimes the hiss ended in a sharp sound like a bark. The patient must have remained in this torture for a minute or more, but the spasms did not spread below the neck. He was sitting on a long chair when the attack began, and during it he got up and sat down on the other side.

During the night he was very restless, continually getting out of bed and walking about. From time to time the spasms came on, and then he was beside himself, struggling and hitting out at anyone who went near him. He drove away his friends, saying that he did not wish to see them.

On the following morning he was very restless and much weaker. The skin temperature was subnormal; the pulse-rate had increased to 120. He had no peace without morphia. The twitching spasms on the left side of the face occurred every second. Occasionally a spasm spread to the platysma of the neck. Sometimes there was twitching of the muscles in the arms. He refused to put anything in his mouth, and an attempt to feed him through a tube produced the most violent spasms. Sometimes he would bathe his parched lips with water, hanging his head over the side of the bed to prevent any drop of the fluid passing into his mouth. He became rapidly exhausted, and on the next day his pulse was imperceptible. There had been no ophthalmoplegia hitherto, but now there was external strabismus of the right eye, which was corrected whenever he focused his gaze upon a definite object. He died at noon on August 30th, about three weeks after the injury and 12 days after the appearance of the first symptoms.

Courtois-Suffit and Giroux, in their war manual on abnormal forms of tetanus,[1] divide the disease into four clinical types: (1) without paralysis, (2) with facial paralysis, (3) with oculo-motor paralysis, (4) with hypoglossal paralysis. The case described belongs to the second group, that with facial paralysis. This form was first described by Rose in 1872, who drew attention to the characteristic triad of prominent

Photograph of patient with cephalic tetanus.

signs which accompany it: (*a*) A wound in the area supplied by the cranial nerves. (*b*) Facial paralysis, generally on the same side as the wound. (*c*) Tetanic spasms of the masseters, the facial muscles, the back of the neck, the pharynx, and the œsophagus. Poan de Sapincourt named it facial tetanus, and drew particular attention to its insidious onset, its slow development, and its treacherous progress.

The point of inoculation in this form of tetanus is always a wound of the head, usually situated in the region innervated by the facial nerve and more often in the zone supplied by its superior branch. The incubation period is generally about eight days, but it may be as short as two or as long as 24. The disease begins, as a rule, with stiffness of the jaws, which is shortly followed by difficulty in speaking and in mastication. The trismus at first is unilateral and on the same side as the wound. One-sided spasmodic contractions of the facial muscles commence soon after the trismus; they usually affect the paralysed side of the face, but sometimes they may be limited to the opposite side, as they were in our patient. In the latter case one-half of the face may wear an expression of profound apathy while the spasms twist the other into a grimace of terrible fury. When the spasms spread to the pharynx and œsophagus, as in the case described, the prognosis is very grave; each attempt to swallow brings them on; sometimes the sight or even the mention of a drink will start an attack, and the condition amounts to

[1] Les formes anormales du Tétanos., M. Courtois-Suffit and R. Giroux, Paris, 1926.

a veritable hydrophobia. The muscles at the back of the neck are usually affected, and cervical opisthotonos frequently occurs during a seizure. As the disease progresses the spasms tend to spread to the rest of the body, but this did not happen in our patient's case, though it might have done so if he had lived longer.

Facial paralysis is an early symptom, but it usually appears later than the trismus. It is limited to the same side as the wound, but it may be bilateral if the injury is in the middle line. In some cases where the wound is close to the eye there may be ophthalmoplegia on the same side; occasionally this appears before there is any trismus, and diplopia may be the first sign of the disease.

The absence of fever is a peculiarity of this form of tetanus, but the temperature rises as the spasms spread. The pulse is always rapid. The prognosis is grave; 16 out of 22 cases cited by Courtois-Suffit and Giroux died before the tenth day, and one died after the disease had lasted more than two weeks.

A CASE OF
PROLONGED TACHYCARDIA, ASSOCIATED WITH CONGENITAL HEART DISEASE,
IN A CHILD FIFTEEN MONTHS OLD.

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AND
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THE unusual features in this case are due to the fact that a ventricular rate of about 300 beats per minute was maintained without intermission for several days on end, without signs of severe cardiac failure or distress. The following is an account of the case up to the present date.

History of the Case.

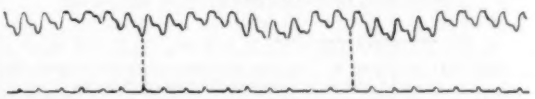
Edna R., the first child of young and healthy parents, was born in August, 1925. The confinement was easy, and nothing was noticed wrong with the baby. There is no family history of heart disease. The child was breast fed, and appeared perfectly normal for the first four months, but then commenced to have attacks which the mother referred to as "fits." These consisted of a slight and sudden rigidity of the child, lasting a few seconds only, and followed by a very brief period of doubtful loss of consciousness. No cyanosis was noted during the attacks, but definite blueness of the lips was observed if the child cried. The attacks were intermittent, intervals of several days frequently occurring, to be followed by perhaps a dozen "fits" in 24 hours. There were no after-effects.

This state of affairs continued until the afternoon of Nov. 13th, when the child had an attack. It was immediately apparent that this was more severe than any of the previous ones. Loss of consciousness was obvious and definite cyanosis occurred. The child was immediately taken to the nearest doctor, but had completely recovered by the time his house was reached. She was taken home and appeared perfectly well again for two hours, when another and yet severer attack occurred. On this occasion the child was brought up to hospital, and when first seen in the casualty department was thought to be dead. The child was of a greyish-blue colour, completely flaccid, respirations had ceased, and at first nothing could be heard on listening over the cardiac area, although a faint fluttering sensation was perceived when the hand was laid over the epigastrium. In the course of the next few seconds definite heart sounds were heard, for the first few minutes at irregular and frequently long intervals. The child yawned and respiration recommenced. About one minute later the heart beat became suddenly regular, taking on a rate of approximately 300 beats per minute. Consciousness had been completely regained.

Condition after Admission to Hospital.

After admission to the ward the child was still markedly cyanosed and rather restless, but in no great distress and making no attempt to sit up. The heart continued to beat very rapidly with a perfectly regular rhythm. On palpation the apex-beat was forcible and of maximum intensity in the fourth left intercostal space, a quarter of an inch outside the nipple line. The cardiac dullness extended from the second rib above, the apex-beat on the left, and a quarter of an inch beyond the right border of the sternum. On auscultation the first cardiac sound alone was audible, loud and explosive in character, and perfectly regular; no murmurs were heard. Every beat was transmitted palpably to the wrist, but owing to the rapidity the pulse was uncountable. An attempt was made by auscultation

FIG. 1.



Tracing from carotid; rate = 300 per minute. Time marker = 1/5 sec.

and an approximate rate of 296 per minute recorded. As the child was restless 5 gr. of pot. brom. were administered. She slept fairly well throughout the night, taking a little milk on two occasions.

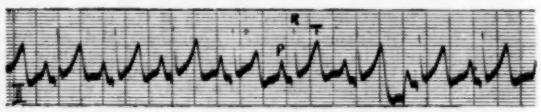
Nov. 14th, 1926: Still a little restless. Cyanosis present, but not so marked. No œdema. No clubbing of the

FIG. 2.

Electrocardiogram (lead II.) taken when the pulse-rate was 270 per minute. Time marker = 1/5 sec.

fingers or toes. No change whatsoever in the cardiac condition. A polygraphic tracing from the apex-beat gave the rate as 300 per minute. Attempts to get venous and arterial tracings failed. The child took plenty of milk throughout the day and slept quite a lot. During the night she was less restless and slept well. Repeated

FIG. 3.



Electrocardiogram (lead II.) taken when the heart was beating at 114 per minute. Time marker = 1/5 sec.

pulse observations proved that it remained persistently rapid.

15th: Cyanosis almost gone. Restlessness quite disappeared. No change in the cardiac condition: apex-beat rate 300 per minute. Child taking milk well but refused anything else. Passed a good night. Pulse-rate steadily maintained. A polygraph tracing was obtained from the carotid (Fig. 1.)

16th: No cyanosis. No restlessness. Child appeared to be perfectly well and happy. Apex-beat rate 300 exactly. Cardiac condition precisely as above; the apex-beat still in the fourth space, a quarter of an inch outside the nipple line. No further increase in the dullness to the right. The pulse-rate was regular throughout the night.

17th: Child taken to St. Thomas's Hospital for an electrocardiograph (Fig. 2). During the proceedings she showed signs of restlessness and got rather cyanosed; the apex-beat rate dropped to 270. Directly the leads, which had been bound on with lint to the forearms and left leg, were removed she became perfectly happy and the cyanosis disappeared. The cardiac rate returned to approximately 300 per minute and remained so. At 2 P.M. she was given ¼ gr. quinidine sulphate. At 2.30 the pulse-rate had fallen to 220, remaining quite regular. By 6 P.M. it had gradually risen to 290. The whole of the time the child appeared perfectly fit. By 6.30 she was asleep and slept practically continuously until 7 A.M. the next day. Various attempts were made to take her pulse during these 12

hours, but unfortunately no results were obtained that can be relied on.

18th: Child seemed in perfect condition. Pulse-rate 134 only and quite regular. During the course of the day this fell to approximately 100 per minute, at which rate it remained until her discharge from hospital 14 days later.

Examination of the heart now revealed very altered physical signs. The apex-beat was in the fourth left intercostal space, a quarter of an inch internal to the nipple line (i.e., half an inch nearer the sternum). The right limit of cardiac dullness was at the right sternal edge. On auscultation the heart sounds were normal and a loud systolic murmur could be heard all over the cardiac area, having its point of maximum intensity near to the left sternal edge over the fourth intercostal cartilage. There was no thrill.

The history of the rest of the stay in hospital is quite uneventful. A second electrocardiograph was taken at St. Thomas's Hospital (Fig. 3) on Nov. 24th.

The following special examinations were performed: 1. X ray of chest: cardiac shadow to the right a little larger than normal. 2. Blood count: entirely normal. 3. Wassermann reaction (blood), negative. Apart from the cardiac condition the child appeared to be perfectly normal in every way. After her discharge the child was seen on several occasions in the out-patient department and appeared to be quite fit. Pulse-rate circa 100 per minute.

On Jan. 12th, 1927, the child was brought to hospital, the mother complaining of no symptoms. On examination her heart was found to be beating at the rate of 240 a minute. She appeared to be perfectly fit and was in no way distressed. There was no cyanosis. She was readmitted and put on quinidine sulphate 1 gr. twice a day. The tachycardia, remaining fairly constantly at 240 beats per minute, continued for three days and then commenced to slow, taking 48 hours to fall to about 100. The quinidine was continued for five days, 10 gr. being given in all. She was kept in hospital one week after her pulse had fallen to normal and was discharged perfectly fit. On this occasion there were no symptoms whatsoever.

The chief interest of the foregoing case lies in the fact that the ventricles were able to respond, over a fairly prolonged period, to an exceedingly rapid supraventricular stimulus. A somewhat similar condition was reported by Dr. J. L. O'Flyn [1] in 1925; in this case, however, no congenital heart lesion was present. The prognosis in the present case is likely to be poor. It seems probable that further attacks will occur; in addition congenital heart disease is definitely present. The treatment of such a case is not satisfactory. The question as to whether the administration of quinidine had any effect on the pulse-rate is very problematical.

NOTE ON A METHOD OF SUTURING THE FAT ABDOMINAL WALL.

BY ARTHUR EDMUNDS, C.B., M.S. LOND., F.R.C.S. ENG.,
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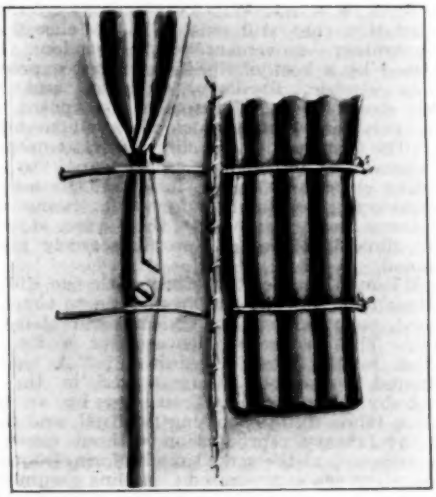
IN suturing an abdominal wall with a thick layer of fat, it is necessary to approximate the deeper layers of the fat, to avoid dead spaces. The large stitches which are inserted, however, cut into the skin, making ugly scars, and until they are removed the patient is usually uncomfortable. There are many devices in use to overcome this difficulty, such as tying the sutures over gauze or a frame, or threading them through short lengths of drainage tubing. I think the following method worthy of trial, as it is simple and effective.

The suture to employ is the eversion stitch described by me [2] several years ago; this is inserted well away from the wound on one side, picks up the whole thickness of the fat—or even the deeper tissues if tension stitches are required—and emerges at a corresponding point on the other side. It is then passed back in the reverse direction, picking up the extreme edges of the incision on the way, and is loosely tied. This leaves a loop of suture on either side of the wound lying flat on the skin. To prevent these loops cutting into the skin I use the corrugated rubber sheeting which Messrs. Allen and Hanbury prepared for me during the war.[3] Most instrument makers sell it now. Two pieces of this are cut, as wide as the loops and as long as the wound, the corrugations lying parallel to the wound. When enough sutures have been introduced, usually about an inch apart, a pair of long artery forceps is passed under the loops of the sutures on one side; the rubber sheeting is then

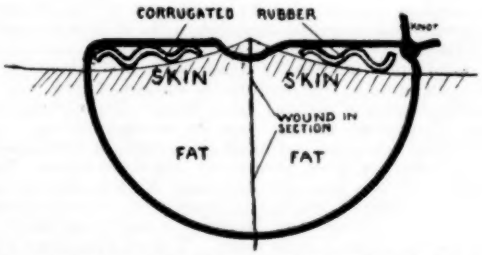
FIG. 1.



The corrugated rubber is shown in position on the right of the figure. On the left the rubber is grasped by the forceps ready to be drawn under the sutures. Two sutures only are shown for simplicity.

compressed laterally, grasped by the forceps, and drawn under the row of suture loops. (This will be readily understood by referring to Fig. 1.) This is then done on the other side of the wound, which may gape a little between the sutures. It is usually possible to adjust the edges with a pair of dissecting forceps so that they are accurately apposed; or, if the surgeon

FIG. 2.



Schematic section of wound, suture, and rubber.

prefers it, a row of running sutures may be inserted. These need not be tied and can be removed as soon as the wound has agglutinated—that is to say, in three or four days. The final arrangement is shown in diagrammatic section in Fig. 2.

If drainage is required there is plenty of room between the big stitches, and the presence of the rubber will not be found to complicate matters at all. When the stitches are to come out, they should be cut over the rubber on the side opposite to the knot, so that they will draw out simultaneously from the deep and superficial punctures.

[1] J. L. O'Flyn: Paroxysmal Tachycardia in an Infant, Brit. Med. Jour., 1925, i., 507.

[2] THE LANCET, 1918, i., 299.

[3] Ibid., 1920, i., 25.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT EDINBURGH.

(*Continued from p. 505.*)

SECTION OF NEUROLOGY.

WEDNESDAY, JULY 20TH.

THE first session of this Section was held under the presidency of Prof. EDWIN BRAMWELL (Edinburgh), and was devoted to a discussion on the

TICS AND ALLIED CONDITIONS.

Dr. S. A. KINNIER WILSON (London) referred to the confusion that still existed in the classification of involuntary movements; the student being bewildered by a host of ill-differentiated expressions such as electric, fibrillary, variable, and habit choreas, electrolepsy, habit spasm, myospasm, myoclonus, polyclonus, paramyoclonus, and myoclonotonus. The first duty of the clinician was to separate such classes of movement as appeared to have distinctive characters and to insist on the adoption of an unvarying terminology for each. Some of the above terms, however, bad as they were, stood for definite clinical entities and would scarcely now be abandoned.

Dr. Wilson then dealt in turn with the different definitions of a tic that had from time to time been advanced, such as those of Cruchet and Meige and Feindel. The distinctive features of a tic were embodied in the latter's definition: "A tic is a coördinated purposive act, provoked in the first instance by some external cause or by an idea; repetition tends to its becoming habitual, and finally to its involuntary reproduction without cause and for no purpose; at the same time its form, frequency, and intensity are exaggerated; it thus assumes the characters of a convulsive movement, inopportune and excessive; its execution is often preceded by an irresistible impulse, its suppression associated with malaise. The effect of distraction or volitional effort is to diminish its activity; in sleep it disappears. It occurs in predisposed individuals, who usually show other indications of mental instability." The important points were the psychical origin of tics, the existence of a psychical defect in impairment of volition, and of a motor defect in the disfigurement or caricature of a normal movement, repeated in season and out of season, but usually containing the recognisable germ of what was once a purposive act of cortical origin; the malaise that accompanied its repression and the relief succeeding its performance, its painless nature, and its disappearance in sleep.

Passing to the symptomatology, Dr. Wilson specially emphasised the abnormal mental state characterised by volitional instability that was associated with tics; in not a few instances, indeed, there was a definite degree of mental infantilism. No feature was more prominent in tic than its irresistibility. The element of compulsion linked the condition intimately to the large group of obsessions and fixed ideas. The varieties of tics were limited only by the number of functional acts of which they might be the caricature, and that number was legion; various facial tics were perhaps the commonest. Tics of the head and neck were also common—nodding, rolling, shaking, &c. Protean tics of the arms occurred—e.g., scratching, rubbing, stroking, pounding. Tics of the trunk and lower limbs were less common. Behind all tic phenomena lay a psychical predisposition. The common association of tics with mental defect and imbecility effectually precluded any other view. In some cases, possibly the majority, the tic made its appearance as the expression or outward manifestation of an unconscious desire, or of a desire that was often but half hidden from consciousness. Dr. Wilson's experience confirmed that of Meige and Cruchet, that tics rarely accompanied hysteria, yet in its egocentricity and failure to govern emotions the temperament of the tiqueur undoubtedly recalled that of the hysteric. Any purposive coördinated act passed by dint of repetition into a habit, an acquired automatism, nor did its character of necessity change if its raison d'être disappeared. Should the now purposeless habit assume an exaggerated form and a haphazard incidence it had degenerated into a tic. Movements of defence against a source of irritation sufficed in some instances to set in motion the processes leading to a tic. Finally, there was the possibility of a tic being engendered on the basis of pre-existing involuntary movements of another class, of which the passing of choreic into tic reactions was probably the best known example.

Prognosis depended upon the degree of volitional impairment of the patient; in some children tics were purely transient; in some adults persistent treatment might certainly effect a cure. The older the patient and his tics, the less favourable were the chances of relief. Treatment resolved itself under the following headings: (1) General hygienic measures—an aim in life, suitable environment, especially the removal of a spoilt child from over-fond parents, disciplinary régime to develop self-control, elimination of septic foci, and care of general health. (2) Sedative medicinal treatment might benefit every now and then, especially when the pathological habit was so engrained in the nervous system as to have shed altogether its psychical element. Many cases in out-patient practice were benefited by a course of bromide in comparatively small doses. (3) Hypnotic and other forms of suggestion had benefited some recorded cases, but Dr. Wilson's own experience had not been reassuring; the same observation applied to psychological technique generally. (4) The principle of treating tics by muscular drill or re-education had justified the confidence placed in it. Brissaud's scheme consisted in requiring the patient to sit perfectly still for increasing periods of time, from a second or two at first to minutes and even hours. The reverse of this method was to cause the patient to innervate the tic groups but in ways contrary to those executed involuntarily. It was a good plan to see this programme carried out in front of a mirror.

Prof. G. C. GUILLAIN (Paris) confined his observations to spasmodic torticollis, which in his experience frequently had an organic basis. He had seen such torticollis in association with pyramidal syndromes and organic familial spasmodic paraplegia, as well as in various post-encephalitic states.

Dr. A. F. HURST (London) dealt with various visceral tics. Most cases of so-called flatulence were in reality due to "aerophagy," or air-swallowing. An attempt at belching for the relief of alleged flatulence resulted in the swallowing of air; repetition of the act caused more air to be swallowed, until such an accumulation occurred that it was eventually expelled. Explanation of this mechanism to the patient often resulted in cure. Other visceral tics were those of sniffing and some forms of coughing, the latter often in association with asthma.

Prof. R. CRUCHET (Bordeaux) summarised the medical literature of tics from the time of Charles Bell (1830), and Marshall Hall (1852). Tics were characterised by repetition in an involuntary, intermittent, and absurd manner, at irregular intervals with an exaggerated frequency. Their execution was imperious and irresistible; their performance could be delayed, but eventually they got the better of the will. He entirely agreed that associated with tics was an abnormal mental state characterised by mental infantilism, instability of ideas, inconsistency, carelessness, impulsivity, and loss of judgment. As regards treatment, Prof. Cruchet favoured the method of "respiratory gymnastics" which was especially beneficial in children.

Dr. B. SACHS (New York) was pleased to hear Dr. Wilson emphasise the frequent psychogenic origin of tics and the association of mental instability. Nevertheless, it was relatively rare to find any marked concomitant mental disturbance. So many tics were begun early in life that it was essential to attack them at that period. Many tics might have been checked at their beginning if the physician had been a

severe disciplinarian. Kindly but firmly the young tiqueur must be told that the tic must stop and that he is the one to stop it.

Dr. STANLEY BARNES (Birmingham) believed that only people of a nervous temperament, mainly inherited, were liable to tics. They occurred, in his experience, more commonly in childhood and adolescence than in adult life. He agreed with Dr. Sachs as to treatment; he himself followed the same course, relying chiefly on discipline.

Dr. GRAINGER STEWART (London) said that tics might arise from seeking a pleasant sensation or in avoiding an unpleasant one. He agreed that the majority were psychogenic in origin, and cited a case in which the tic had disappeared following revival under hypnosis of a forgotten memory.

Dr. R. G. GORDON (Bath) considered that there might be organic factors which determined the origin and nature of the tic in the psychopathic individual. Torticollis, for instance, might originate from muscular rheumatism of the trapezius. It was necessary, therefore, to examine the patient carefully for pathological conditions other than in the nervous system and treat the lesion accordingly.

Dr. N. D. ROYLE (New South Wales) had found chronic arthritis of the cervical vertebræ in association with spasmodic torticollis.

Dr. A. J. BROCK (Edinburgh) agreed fundamentally with the disciplinary method of treatment, but thought that the particular symptom should be less emphasised and more attention paid to the underlying psychical constitution.

Dr. P. C. CLOAKE (Birmingham) said that only one psychic motive for the persistence of tic had been referred to—viz., the satisfaction derived from the pleasurable sensation obtained from the performance of the tic. It was equally important to realise, however, that in the psyche there were different levels of function and ample opportunity for psychic motivations in addition to this.

THURSDAY, JULY 21ST.

The second meeting of this Section was held in conjunction with the Section of Mental Diseases. Prof. EDWIN BRAMWELL again presided, and the subject of discussion was

EPIDEMIC ENCEPHALITIS.

Dr. IVY MCKENZIE (Glasgow) described the history of the disease, especially in Glasgow, and also dealt with the epidemiology. From 1918 to 1924, he said, the attention of the profession had been directed to a "new disease," accounts of which came from various parts of the world and a description of which had already been given a year earlier by von Economo in Austria. That it was new admitted now of no question. An anatomical basis was soon established in a non-purulent form of encephalitis which was discovered in every case which came to autopsy. In its pathological anatomy encephalitis lethargica differed from other forms of encephalitis in that there was an absence of naked-eye signs of disease in the central nervous system. In the acute stage the microscopical lesions were diffuse, were of a moderately acute inflammatory character, and tended to be more pronounced in the basal ganglia and the substantia nigra. In the Parkinsonian syndrome it had been found that the most pronounced lesions were in the substantia nigra. Dr. McKenzie was not convinced, however, that the histological appearances resembled those observed in such chronic affections of the central nervous system as syphilis, tuberculosis, malaria, or trypanosomiasis. The possibility must be taken into account that the degeneration of the substantia nigra was not an isolated lesion accountable for the clinical phenomena in the sense that anterior cornual degeneration accounts for the paralysis of poliomyelitis, or destruction of the motor cortex accounts for upper neuron hemiplegia. It was more likely that the Parkinsonian sequelæ were the expression of a disordered function of the whole compendium of reflexes related to the basal nuclei, the mid-brain, and the vestibular apparatus, and concerned with the regulation of those phases of automatic posture which rendered voluntary movement possible. The virus responsible for encephalitis appeared to show a predilection for the great correlating centres of the nervous system—that is, for the grey matter on the afferent side of the proprioceptive system, for certain basal nuclei, and for the posterior cornua of the cord. He suggested, therefore, that the Parkinsonian sequelæ was due to a functional derangement of this system incident to the destruction of some of its vital parts in the early stages of encephalitis.

Dr. J. G. GREENFIELD (London) dealt with the ætiology, clinical pathology, and morbid histology of the disease. He said that the virus responsible for encephalitis lethargica had not yet been identified, and that it was still uncertain if the disease had ever been transmitted to animals. Some workers claimed that the ætiological agent was identical with that of herpes febrilis, differing from it only in possessing a greater affinity for the nervous system. The only serious criticism brought against this theory was that in the few instances in which encephalitis had been caused in rabbits by inoculation of human material, the virus of herpes febrilis had been accidentally included. This might well have been so in Levaditi's first case, in which herpetic vesicles were present at death. In fact, Flexner had obtained an apparently identical virus from the cerebro-spinal fluid of a convalescent case of neurosyphilis. Herpes was a common and widespread disease in man, and the fluid from herpetic vesicles was constantly pathogenic to rabbits. The whole question remained sub judice. The only laboratory examination which gave any assistance in the clinical diagnosis of the disease was that of the cerebro-spinal fluid. In the early stages of the disease this fluid might be quite normal or might contain a slight excess of glucose, which was of doubtful significance. Usually, in the first few weeks of the disease, however, there was a lymphocytosis of 10 to 100 or even more cells per c.mm. The cells were usually all mononuclear, with occasional polymorphonuclear cells. Excess of protein was exceptional, and a coagulum practically never formed. Not infrequently the colloidal gold reaction gave a curve of the luetic type; paretic curves were much rarer. With regard to the histological picture of the disease, there had been a tendency to focus attention on the mid-brain, forgetting the cerebral cortex. He did not agree with Dr. McKenzie that the lesions were confined to the proprioceptive system, and he showed slides illustrating involvement of the anterior cornual cells of the spinal cord.

Dr. GEORGE RIDDOCH (London) considered the chronic forms of the disease, and maintained that encephalitis lethargica was a chronic malady comparable in its course with neurosyphilis and disseminated sclerosis. An important group of cases was that in which the disease appeared to be chronic from the outset. Although the virus had a predilection for the brain-stem and corpus striatum, no part of the nervous system was immune. With such a widespread infection, classification on rigid anatomical or physiological lines was impracticable. The Parkinsonian syndrome, however, was the most common disability of a general kind in adults resulting from the disease; it might appear rapidly during the acute illness, but more often its evolution was slow and progressive, although in its course there might be stationary periods. As the clinical picture in its fully developed form was so familiar, Dr. Riddoch confined his observations to milder forms of Parkinsonism. In its minimal development there was slight fixity of the facial expression and of the eyes, a tendency to hold the head still, and a diminution in the natural fidgetiness of the healthy individual.

Dr. Riddoch next dealt with the various involuntary movements—choreiform movements, bradykinesia, myoclonic movements and tremors, muscular atrophy, and spastic paraplegia—that might result from the disease. He also described the forms of respiratory disorder and the endocrine involvements—as shown

by adiposity, diabetes insipidus, &c.—that might occur. Finally, he mentioned a clinical picture of chronic encephalitis lethargica termed the "asthenic syndrome," of which enfeeblement was the constant and main symptom, and in which the physical signs might be slight.

Dr. R. M. MARSHALL (Glasgow) dealt mainly with the mental aspects of encephalitis lethargica. Age, he stated, appeared to play an important part in the incidence of the residua and sequelæ of the disease. Psychomotor excitement, with or without nocturnal wakefulness, and somnolence in day-time, choreiform movements, and disorders of respiratory rhythm all showed a preference for the early years of life. On the other hand, the Parkinsonian syndrome, melancholia, confusion, and residual palsies, were the appanages of youth and adult life. Much attention had been paid to the moral aspect of the behaviour of the restless, naughty child, but very little had been said about the maniacal character of his misbehaviour. There was nothing cunning or underhand about the misdemeanours of these children; unlike delinquents, they did not choose a convenient season in which to commit misdeeds; they carried them out in the public eye. In brief, there was much instability and little or no evidence of moral depravity.

Prof. R. CRUCHET (Bordeaux) maintained that slowness of movement (bradykinesia) in post-encephalitic states was quite independent of muscular hypertonus. He also showed graphs illustrating the increase in the muscular relaxation-time in cases of hypertonia, together with others demonstrating the greatly decreased relaxation-time following the injection of scopolamin.

Prof. G. C. GUILLAIN (Paris) described several cases in which the patients complained of symptoms that at first appeared to be those of myasthenia gravis. Subsequent investigation showed the cases to be examples of post-encephalitic disorders, a fact which emphasised the importance of fully investigating the physical signs and history in all cases of apparent myasthenia and neurasthenia.

Dr. EDWARD MAPOTHER (London) drew attention to the fact that many cases of post-encephalitic states might be missed if attention were focused only upon the psychological aspects. The severity or otherwise of the acute phases bore little or no relation to the development of mental symptoms. Also, the intensity of mental symptoms was quite independent of the degree of physical disability.

Dr. B. SACHS (New York) had found that ocular manifestations were usually the first signs of the disease. Not a few cases, however, might begin with an apoplectiform seizure. He thought the term "central and basilar encephalitis" was a better designation of the disease than "encephalitis lethargica."

Dr. W. A. POTTS (Birmingham) regarded the disease as chronic, specific, and progressive. He had met with Parkinsonian cases alternating between euphoria and depression. As regards treatment, Dr. Potts stated that he had seen good results even in chronic cases following the use of autogenous vaccines, the latter being made from organisms obtained from the nose and throat. Prolonged Plombière's treatment was also of value.

Prof. KARL PETREN (Sweden) called attention to the value of the nasopalpebral reflex of Guillain in the diagnosis of Parkinsonism. This consisted in the exaggeration of blinking of the eyelids elicited in tapping the skin about the root of the nose. In Prof. Petren's experience, the interval between the onset of encephalitis lethargica and the development of a Parkinsonian syndrome had never been longer than four years; it was a question of great practical importance to determine how long this interval could be, and if others had had the same experience as he.

Dr. N. G. ROYLE (New South Wales) gave a cinematograph demonstration of two cases of Parkinsonism in which posterior sympathetic ramisectomy had been performed. The films showed the condition of the patients before and after operation, improvement being very striking.

Dr. J. M. WOLFSOHN (San Francisco) said that it had been his experience that few acute cases of the disease passed into a chronic stage if six months' complete freedom from mental and physical fatigue were insisted upon. The management of an acute case included complete rest, intestinal antisepsis, and the administration of polyvalent autogenous vaccines made from intestinal and nasopharyngeal organisms.

Dr. T. A. ROSS (Penshurst) emphasised the importance of a full and accurate history if many cases of neuroses were to be distinguished from encephalitis lethargica.

Dr. POSTON (Oldham) described a case with involvement of ocular muscles, the eyeballs being ordinarily immobile. Following the syringing of the ears with cold water the patient was able to move his eyes temporarily in all directions.

Dr. P. C. CLOAKE (Birmingham) considered that the mental symptoms of encephalitis lethargica were those of a toxi-infective type, and resembled in some ways the acute mental effects of toxins such as alcohol. He thought the mental changes could best be understood by regarding mental and nervous phenomena as evidences of orderly evolution and distribution of energy derived from neuron activity at different levels in the nervous system.

SECTION OF DERMATOLOGY.

THURSDAY, JULY 21ST.

THIS Section met under the chairmanship of Dr. R. CRANSTON LOW (Edinburgh).

Dr. S. E. DORE (London) opened a discussion on

THE USES AND LIMITATIONS OF ULTRA-VIOLET RADIATION IN DERMATOLOGY.

He quoted from a paper, written in 1902 by himself jointly with the late Sir Malcolm Morris, the words: "Although in our opinion the results we have obtained have fully justified the employment of the treatment, and in some cases no other treatment could have produced such good results, we do not regard it as the only method to be used in all cases, nor advocate it indiscriminately to the exclusion of other methods." This was still his opinion to-day. After reviewing the history of light treatment and the modifications of the original Finsen lamp, Dr. Dore pointed out the difficulty that modern apparatus had not solved—that is the lack of penetrating power in mercury-vapour and tungsten lamps, and the small area available for concentrated carbon arc rays. He doubted whether many extensive cases of lupus were cured by unaided light treatment. With surgical measures and selective caustics much more rapid results could be obtained. There was no doubt that ultra-violet radiations were an excellent stimulant of hair-growth, but the tendency to spontaneous recovery made it difficult to assess the value of light treatment in alopecia areata. The results seemed to depend, as in lupus, on the intensity of the inflammatory reaction. He had seen extensive psoriasis eruptions clear up under light-baths and relapse during a continuance of the treatment; the majority of cases showed little permanent improvement. It seemed probable that better results would follow strong inflammatory reactions with erythema and desquamation, but in most cases equal benefit could be achieved more quickly by chrysarobin. Improvement in acne vulgaris was chiefly due to exfoliation; the results were not much better than those following keratolytic preparations, and were much worse than those produced by X rays. Light treatment benefited cases of impetigo and staphylococcal infections which failed to yield to antiseptic applications; it was also useful in chronic septic and tuberculous ulcers, and in some acro-asphyxial conditions. The combined local and general use of light, first advocated for lupus by Reyn in 1918, did not invariably produce good results. The biological action of the rays was probably mainly destructive, although in rickets the effect was

ascribed to activation of the skin cholesterol. Heat and fresh air were probable factors in the increase of hæmoglobin and leucocytes. The stimulating effect on operators was very likely due in part to the inhalation of ionised air, and the psychological factor must not be forgotten. Nor must luminous and heat rays be left out of account, since comparatively few ultra-violet radiations could penetrate the atmosphere. The value of glass transparent to ultra-violet rays was problematical in cities. The basal metabolic rate was not raised by actinic light unless cooling air were also present, and the hardy northerner took precedence, in health and endurance, of the softer, sunbaked, ultra-violet-lighted southerner.

Dr. F. GARDINER (Edinburgh) stressed the psychic effects of ultra-violet therapy, and deprecated its commercialisation. Its value in rickets was established, but beyond that there was an ever-increasing area of doubt. We had as yet insufficient data from the physicist and biochemist. Useful additions to the simple lamp were focusing with a quartz lens and applying sufficient pressure to render the part anæmic. In tuberculosis of the skin light gave great benefit; occasional failures were probably due to the association of pulmonary affection with the skin condition. Fungating and ulcerated types responded most rapidly. Out of 171 cases treated by him since 1924, 27 had been cured and 65 improved. The addition of treatment by trichloracetic acid and caustics had given better healing and good cosmetic results. At present the carbon arc was the best lamp, and the mercury vapour the least satisfactory. Lupus erythematosis was not one definite disease, but those cases which were associated with a toxic focus responded to light, as did skin diseases associated with general debility. Prurigo in children, but not in adults, was benefited. Light would allay the superficial pustulation of sycosis, but the condition might be aggravated by light applied by inexperienced workers. Psoriasis was made worse, but alopecia areata was improved. Varicose and chronic ulcers were palliated, but it was for the Bazin type of ulcer that light was especially useful. In conclusion, Dr. Gardiner said that the effects of light were systemic, and it could be used where there was some systemic disturbance; also as a stimulant for certain areas, and to reduce pustulation.

Organisation in the Treatment of Lupus.

Dr. W. J. O'DONOVAN (London) reviewed the history of the light department at the London Hospital. He said that optimism or pessimism towards the problem of lupus depended on how it was tackled: it was a fight needing an organised daily attack. The nodules should be treated night and morning, and the intervening time filled in with general light baths. It was essential that the patients be under control; the public health authority must pay their fares, see that they had proper nourishment and so on, and there must be a school within the light department. In these circumstances the extent of the disease need cause no anxiety; the only incurable cases were those with lymphatic obstruction of the face. The type of patient who had had his trouble for 30 years and only came up on the persuasion of his friends was better untreated, for he would not attend regularly and would only disgrace the department. Picked cases, however, would give 90 per cent. of cures. Among the rare disasters might be mentioned three deaths during light treatment for infection of the larynx, one suicide, and three cases of tuberculous meningitis. Cancer following light treatment had never been seen in all the 26 years' experience of the London Hospital. Psoriasis might be temporarily benefited, and, anyway, the course was encouraging to the patient. He had seen cases cured by exfoliation—ten minutes of the mercury-vapour lamp at 2 feet for a week, and then at 1 foot. Exfoliation might also cure acne, but the speaker had seen this complaint develop during a course of light treatment. As to prurigo, if light comforted these patients they should have it, and if there was lichenisation they should have it strong. For the purely psychic case it was as good as any other treatment; the patients appreciated it, and were, at any rate, free from messy ointments. Multiple subcutaneous abscesses in infants might be dispersed by three months of steady light treatment. For septic compound fractures light was extremely useful, lowering fever and promoting healing of sinuses and separation of sequestra.

Prof. J. G. TOMKINSON (Glasgow) related his personal experience of light therapy in lupus and emphasised its psychic value. He characterised it as one of the most useful therapeutic agents of the present century, even if it went no further than clearing up the loathsome features of extensive ulcerating tuberculous lesions.

Dr. T. C. GILCHRIST (Baltimore) quoted the unpublished work of a fellow-countryman who had succeeded in measuring the dosages of ultra-violet rays by the use of lithopane.[1] Much more harm than good had been done by X rays, and there was a danger of the same results following the indiscriminate use of ultra-violet light. More people were extremely sensitive than was recognised; possibly they could be desensitised by small doses. Sunlight, in his opinion, certainly could produce cancer. Other workers had succeeded in obtaining the "border rays" between the X and the ultra-violet, and had had good results from their use in cancer of the skin. The group called "ultra-violet" might be a mass of rays, many of which were not necessary. He suggested an answer to the problem of why hydroa vacciniforme with hæmatoporphyrinuria should be fatal, that the collapse of the blood pressure was a reflex excitation of the medullary centres due to the effect of light on the nerve endings in the skin. Lupus was very rare in America. He stressed the value of diathermy, as the desiccating knife left a sterile partition between the diseased area and the healthy, which the surgeon's knife could never do.

Sir NORMAN WALKER (Edinburgh) recalled the early history of lamp treatment, and said that many of the first patients were wonderfully well to-day. He queried the value of the present-day tendency to get stronger and stronger lamps, and thought it might be better to have longer exposures to rays of less intensity. He agreed with Dr. O'Donovan about the need for organisation in light therapeutics. Very many treatments did lupus good—Unna's old salicylic acid paste was still one of the best. It was essential for the doctor to be an optimist. Perseverance was the first lesson Finsen had taught. X ray treatment led to many deaths, and was only justified in the hands of a real expert. Moreover, there was a chance that it would produce cancer of the skin. There was no doubt that sunlight caused cancer exactly like X ray cancer. It was time to put a brake on the extreme use of light. Early diagnosis was of the greatest importance. He thought that with modern fashions the neck escaped psoriasis more often than it used to. Unfortunately, practitioners had been taught for generations to give a bad prognosis for this condition, but if the patients could be persuaded to persevere to the end very many of them got well.

Dr. H. MACCORMAC said that the claims of light therapy had been exaggerated in some quarters. Results in lupus and psoriasis were variable, and the former seemed to depend in some measure on the place in which the patient got the disease and was treated. Scandinavians were more liable to tuberculous conditions of the skin than other races, and their lesions tended to clear up more readily. In Austria these skin conditions were almost unknown, but cancer was much more common. Of six patients who had had total alopecia for many years, five had almost completely recovered under violet light. Some tabes patients reached a stage where they hung fire; it was then useful to knock off all antisyphilitic treatment for a time and give a course of ultra-violet rays. Marked improvement often followed.

Dr. W. MITCHELL (Bradford) preferred diathermy to any other treatment for lupus; it produced a

[1] See also Amer. Jour. Phys., 1924, l., 49.

soft scar with no pitting. Cases sent up for light treatment as labelled malnutrition should always be investigated for diabetes.

Dr. A. C. ROXBURGH (London) agreed with Dr. Dore's remarks, and commented on the value of ultra-violet light in the diagnosis of ringworm. Fluorescence was seen on the infected hairs through Wood's glass. This method had been found very satisfactory as a test of cure after treatment and as a means of detecting very early infections. General light baths were valuable in tuberculosis of the skin, especially as an adjunct to local caustics. They benefited 50 per cent. of those who could not have sanatorium treatment, but would not take the place of air, good food, and sunlight. There was a certain risk of lighting up a lung infection. Light was very useful for multiple boils, superficial sepsis, unhealed wounds, and a few chronic dermatitis and eczema cases. Locally it benefited alopecia and telangiectasis after X rays. Sycosis might be improved but could not be cured. The spread of alopecia was not affected, and the treatment was of no use for premature baldness. Acne was much better treated by X rays, and the results in psoriasis were no better than those of chrysarobin. Seborrhœic dermatitis was aggravated.

Dr. R. AITKIN (Edinburgh) quoted cases of hypersensitiveness to light, and said that the armlet was of no use for gauging reactions. He had tested artificial silks, but had found no evidence that they let the ultra-violet rays pass.

Dr. HALDIN DAVIS, answering a question from Dr. Aitkin about the use of ultra-violet rays for ringworm, said that he had had cases previously treated in vain with light which cleared up completely with X rays.

Dr. F. D. HOWITT (London) said that artificial light never gave the same results as sunlight, but went some way towards it. It was best for cases, such as alopecia and prurigo, where the sympathetic system was involved, for those where the resistance of the body was reduced by infection, as in syphilis, tuberculosis, acne, sycosis, and lupus, and where the ionic calcium was lowered, as in the catarrhal child. Good results could not be obtained from two or three treatments, and more harm than good was done by large exposures.

Dr. K. RUSSELL (Newcastle) doubted whether there were any difference between the results from real and artificial light—for example, from Leysin and Copenhagen. Many conditions could not be treated by natural light. He had treated ringworm successfully with ultra-violet light.

Dr. W. BROWN (Glasgow) spoke of the need for educating the public, and of the abuse of ultra-violet or so-called violet light in such places as beauty parlours.

Sir ROBERT BOLAM (Newcastle) said that the truth lay between optimism and pessimism, and caution should be the note of the day. He stressed the value of general control and discipline associated with the light treatment of lupus. No one who had seen skin carcinoma in field workers would forget that we were dealing with something a little dangerous in X rays.

Dr. CHRISTINA BARROWMAN spoke of the general improvement and relief from pain effected by ultra-violet light treatment of burns. She had cured very early cases of ringworm in babies with light.

The PRESIDENT rated the danger of carcinoma after X ray treatment of lupus at 50-60 per cent. It would be years before the results of ultra-violet treatment could be known, and it therefore behoved workers to go cautiously. Everybody was experimenting with it; it was for the dermatologists to find out the underlying principles. He suggested that the benefit in lupus was due to the fact that the antibody to tuberculosis was anchored in the skin itself. Possibly all the diseases which gave marked skin reactions were those likely to be benefited by light therapy.

Dr. H. C. G. SEMON (London) read a paper on the

Value of Krysolgan in Lupus Erythematosus.

Reviewing the evidence for and against the tuberculous theory of the ætiology of this condition, he summed up in its favour, and said there was no doubt of the value of gold treatment in some types of case. Krysolgan was an attempt by the firm of Schering to get a non-toxic product. The urine should be tested for albuminuria during treatment, and renal tuberculosis was a direct contraindication. Increasing weekly doses of 0·015, 0·15, 0·375 and 0·75 grains should be given. There was no febrile reaction, but stomatitis or dermatitis might occur and there might sometimes be fleeting pains in the fascial spaces. A focal erythematous reaction indicated a good prognosis. Of nine cases which Dr. Semon reported fully, six had been greatly improved, one unimproved. German workers had had better results. He called attention to a high proportion of tuberculous ætiology in the histories of the successful cases. He concluded that, although the treatment was not free from risk, the disease was at least as distressing to the patient as syphilis, in the treatment of which equal risks were taken.

Dr. GILCHRIST pointed out that the same cause could produce widely different clinical appearances. Lupus erythematosus cases could be grouped into those which were tuberculous and those which were not. He mentioned three cases cured by radium.

Dr. O'DONOVAN said he had tried krysolgan on seven cases: two were distinctly benefited.

Dr. ROXBURGH had also had seven cases; three were cured, two much improved, and two unaffected after 11 doses. It was a very useful treatment, but only time could show whether its results were permanent. Many cases could be cleared up temporarily by protein shock.

Dr. HALDIN-DAVIS quoted nine cases with two cures. Others had shown temporary improvement. He gave smaller doses than those indicated by Dr. Semon.

The PRESIDENT remarked on a characteristic skin rash developed by patients treated in the medical wards with sanocrysin. It looked just like lupus erythematosus, but always cleared up.

Dr. G. B. DOWLING (London) read a paper on the

Treatment of Tinea Capitis with Thallium Acetate.

He said that this was a subject which ought to be thoroughly thrashed out. X ray epilation had certain well-known disadvantages. A dose of 8 to 9 mg. per kg. of body-weight of thallium acetate produced satisfactory and complete baldness. Over a thousand cases had been reported from the Continent, and the speaker had tried it on 100 cases during the last three years; ten were still under treatment. On the seventh day the hair loosened, on the fourteenth it came out, and depilation was complete on the nineteenth save for some fine lanugo hairs which never fell and were never attacked by ringworm. Generally the eyelashes and eyebrows remained, though the outer third might be thinned. Sometimes stumps would not fall spontaneously, but brushing brought them out, except on a few occasions, when a fungicide had to be used all over the scalp to protect the new hairs which soon appeared. Ointment should be rubbed in all over the scalp twice daily from the first, and stumps removed every day. This should be continued for two weeks after all traces of infection had disappeared. Regrowth generally began within a fortnight. Combination of thallium and X rays did not work, but all the children under 3 treated with thallium alone were cured, as were 35 out of 46 over 3. The toxic effects must not be forgotten; only two cases had been entirely free from them. The children were peevish, anorexic, and drowsy to a very variable extent. In animals the thyroid suffered and the children showed hypo- or a-chlorhydria. Small doses of thyroid and hydrochloric acid produced rapid recovery. Very young children were more tolerant of the drug than older ones, but none were any the worse for it in the end. There was no danger of permanent epilation, and the cost was very slight. The toxic effects and some uncertainty of complete epilation were the only disadvantages.

Prof. J. G. TOMKINSON pointed out how unfortunate it was that epilation was inseparable from the treat-

ment. The ideal method would be to anticipate and dispel the infection without epilation.

Dr. ROXBURGH described 19 cases treated at St. Bartholomew's Hospital. Eleven were cured, and four had not been followed up. He gave 8·5 mg. per kg. of body-weight.

Dr. SEMON said he had been using the method since Dr. Dowling introduced it. No effort should be spared to find some new method of treating this socially serious condition. He had had one failure only out of 20 cases. He followed up epilation with Dr. Adamson's ointment (equal parts of sodium chloride and vaseline), which produced a superficial folliculitis and brought out the stumps. Thiosulphate of soda might prove a useful antidote for the toxic effects.

SECTION OF VENEREAL DISEASES.

FRIDAY, JULY 22ND.

THIS Section met under the presidency of Mr. DAVID LEES (Edinburgh), the morning session being devoted to

ROUTINE EXAMINATION OF CEREBRO-SPINAL FLUID IN SYPHILIS.

Mr. C. H. MILLS (London) pointed out that upon early recognition of involvement of the central nervous system depended much of the subsequent management of the syphilitic patient, and the prognosis from a neurological point of view. The routine examination of the cerebro-spinal fluid was therefore absolutely essential in the management of syphilis at all stages of the infection. In the primary stage it was an advantage, in the later stages it was imperative, to know the condition of the cerebro-spinal fluid before beginning treatment. The initial course of treatment should be standardised to consist of the administration of not less than 4 g. of salvarsan, or the equivalent of neosalvarsan plus bismuth and mercury, over a period not exceeding 14 weeks. This course should be looked upon as more or less of a therapeutic test, and should be followed by re-examination of the cerebro-spinal fluid within six weeks of the cessation of treatment. In the earlier cases this period was, he thought, the most critical epoch in the career of a syphilitic, since it was then that the cerebro-spinal fluid might provide possibly the first and only indication of invasion of the central nervous system. The warning obtained from routine examination at this period should entirely prevent the subsequent development of meningeal relapses and their sequelæ.

Discussing the importance and significance of the various tests, Mr. Mills said that the Lange colloidal gold reaction was used in all the frankly neurological cases in his own series, and from ten years' clinical observation of the progress of a considerable number of neurosyphilitics he was convinced that a paretic Lange curve, accompanied by a persistent positive Wassermann reaction in the cerebro-spinal fluid, was strong presumptive evidence of parenchymatous involvement of the central nervous system. Revised intensive schemes of treatment should be started at once in all such cases, thus saving much valuable time. In every early case treated *ab initio*, the cerebro-spinal fluid should be examined, together with a blood Wassermann test, at the end of the first, second, third, and fifth years. All cases presenting a persistent positive blood Wassermann reaction, at whatever stage of the infection the patient first came under observation, should have the cerebro-spinal fluid investigated besides a careful neurological examination. By routine procedure of this kind the disasters attendant upon cerebral and spinal endarteritis would be anticipated and by adequate treatment they would be entirely prevented. He urged that a routine blood Wassermann test should be made upon every patient at all medical institutions, irrespective of the nature of the complaint, and when this was found to be positive an investigation of the cerebro-spinal fluid should follow. Furthermore, once the cerebro-spinal fluid had been found to be pathological in a syphilitic case, subsequent examination of the fluid was imperative for many years after it had been rendered normal. This regular re-examination was especially indicated in any case which had once relapsed, and in definite cases of neurosyphilis after the fluid had become normal. If lumbar puncture were limited to the cases with obtrusive signs irreparable damage might result, since a low-grade parenchymatous encephalitis, with little or no meningeal involvement, might exist for years with indefinite symptoms impossible to classify or interpret without the aid of spinal fluid tests. On the other hand, certain types of neurosyphilis, including the purely vascular type, gumma unaccompanied by meningitis, some unusual psychoses, and luetic epilepsy were often found with little or no change in the cerebro-spinal fluid. Even in the presence of such negative findings, however, the neurosyphilis could be much benefited by specific treatment.

The earlier treatment was begun the greater was the chance of preventing syphilitic involvement of the central nervous system; the earlier the recognition of such involvement, when it had occurred, the greater the possibility of preventing the invasion of the parenchyma.

Dr. GEORGE RIDDOCH (London) said that no one could question the necessity for examining the cerebro-spinal fluid in the early stages of syphilis. But it was necessary to consider what was the value of positive findings without clinical manifestations of involvement of the central nervous system, and what was the value of negative findings. There was discrepancy in the results of various observers. Mr. Mills had found that 4 per cent. of patients with primary syphilis had a positive Wassermann reaction in the cerebro-spinal fluid, whereas observations at Haslar during the war put the figure at the same stage as 14 per cent. Again, what was the value of a gold sol paretic curve six weeks after infection? Did it mean that paresis would really occur? Very many more findings were required, extending over a greater length of time, before the procedure could be standardised. Would serological examination be required at intervals during the whole life of a man who had once had a positive reaction in the cerebro-spinal fluid? Where tests had been positive and neurosyphilis had developed, the patients were, in Dr. Riddoch's opinion, unsafe for life. It was essential not to lose sight of the patient himself when dealing with his blood and cerebro-spinal fluid. Antisyphilitic drugs were poisons, and it was a mistake to chase after a positive Wassermann to the neglect of the patient's general health.

Dr. D. K. HENDERSON (Glasgow) said that there could be no question about the value of lumbar puncture. Who could give the prognosis in a mental case, without all the investigations—Wassermann reaction, globulin estimation, and cell count? Lumbar puncture, however, sometimes caused very severe headaches, and the only way to prevent these was to put the patient to bed for 24 to 36 hours. With the present methods of treatment, we might look forward to less neurosyphilis in the future. Sometimes, said Dr. Henderson, there was no correlation between clinical signs and pathological findings, and it would be wrong to diagnose parenchymatous syphilis on the pathological findings alone, to the patient's relatives. On the other hand, he quoted the case of a woman who in 1922 suffered from general paralysis of the insane, who then improved and was discharged, was readmitted, and was now a typical case of general paralysis of the insane in spite of the fact that all the pathological reports were negative. Again, a typical paralytic had gold sol, Wassermann, and other tests all negative. Clinical cases of several years' standing often reacted better to treatment than earlier and supposedly more favourable cases. He had seen cases in which tabes developed in spite of good intravenous treatment in the early days of the syphilitic infection.

Dr. J. G. GREENFIELD (London), referring to the use of the Kahn precipitation test for cerebro-spinal fluid examination, said that its results compared

favourably with those of the Wassermann reaction, but there was a tendency for the Kahn test to be negative earlier in treatment, while the Wassermann reaction was still weakly positive. Boltz's acetic-anhydride test was specific for general paralysis as distinct from cerebral syphilis. The very purest chemicals must be used and a negative result was of no value. The Kafka colloidal paraffin reaction corresponded closely with the Lange test and the type of curve corresponded better than with the mastic or bezoin reaction. Wu's colour estimation of the actual quantity of protein in general paralysis of the insane was of great value. Wu had used it for the estimation of globulin and protein, and had found that general paralysis of the insane was the only condition in which there was approximation of these substances. There were substances in the blood, said Dr. Greenfield, which inhibited the Wassermann reaction and so prevented the blood from showing as strong a reaction as it should. After treatment by malaria and tryparsamide it might be found that the cerebro-spinal fluid was strongly positive although the patient was apparently cured.

Colonel L. W. HARRISON said that whilst he had every sympathy for Mr. Mills's enthusiasm, he also had sympathy for the patient and perhaps also for the pathologist, particularly in view of the further four tests which Dr. Greenfield had mentioned. A working compromise might perhaps be to test the cerebro-spinal fluid in cases selected according to their behaviour to the first course of treatment. Analysis of the results of treatment in cases of syphilis in males at St. Thomas's Hospital had shown that in a high proportion of sero-positive early cases which were still positive at the end of the first course further treatment, even to the extent of six or seven courses, has not resulted in a reversal of the reactions. In a high proportion of these refractory cases, again, the cerebro-spinal fluid had been found after many courses to be positive. On the other hand, among early cases in which the serum was negative at the end of the first course and in which the patients had remained under regular treatment, he had not yet seen one with a positive cerebro-spinal fluid at the end of the programme of treatment. He thought that the first examination of the cerebro-spinal fluid in early cases might be limited to cases which had not responded with a negative serum reaction to the first or second course of treatment. It seemed preferable to carry out complete examinations on the few fluids likely to be positive than to make necessarily cursory examinations of the multitude; he said this without prejudice to the necessity of examining the cerebro-spinal fluid in all cases before discharge from treatment.

The failure of a proportion of cases to respond to routine treatment had made him think that some means should be sought for changing the tissues so as to make them responsive as soon as the serum reactions were not found negative at the end of the first course of, say, 6 g. of "914" with 4 g. of bismuth (as given at St. Thomas's Hospital). It was perhaps a mistake to go on pushing in more specific remedies in the hope that the spirochæte would be worn out by sheer weight of remedy. Some time ago Major Pettit had reported that at Rochester Row an unresponsive early case had been made responsive by the administration of thyroid, and perhaps by this or some other means the outlook in unresponsive early cases might be changed. Colonel Harrison was convinced that neurosyphilis was less likely to develop later if arsenobenzol was employed simultaneously with another metal (mercury or bismuth). In his own clinic the simultaneous method of treatment of early cases had never been followed or attended by cranial palsy.

Mr. VOGES (Edinburgh) read a paper on new tests useful in examination of the blood and cerebro-spinal fluid. The test depended on the use of colloidal gum benzoin, and in Mr. Voges's opinion it was easier to carry out than the colloidal gold reaction, and secured results very comparable.

In the course of the subsequent discussion,

Dr. FREELAND SMITH (Boston, U.S.A.) spoke of the necessity for painless spinal puncture. He believed that headaches after lumbar puncture were due to hypotension, but were not necessarily the result of using a big needle.

Mr. DUNCAN LEES (Edinburgh) described himself as optimistic about modern forms of treatment. He showed cases of tabes and general paralysis of the insane in juveniles, and some adult cases of general paralysis of the insane and of tabo-paresis, in most of which there had been marked improvement with malaria. He believed that malarial treatment at present had a better effect than anything else on the mental condition in these cases, though often the serological reaction was very slow in showing improvement.

Dr. LAURA STEWART SANDEMAN (Aberdeen) said that she was struck by the interference of syphilis with endocrine function, causing in some cases amenorrhœa. Administration of thyroid might sometimes restore the system to normal and help the patient to get benefit from antisyphilitic treatment.

Dr. MARGARET RORKE (London) said that modern text-books stressed the need for frequent lumbar punctures in the treatment of syphilis. Dr. Riddoch had rightly referred to the human element in treating patients, and she would like to have some guidance as to how often it would be considered necessary to examine the spinal fluid in women under the following conditions: (*a*) in the event of all findings being negative early in treatment, and the patient attending regularly and receiving all the treatment considered necessary; (*b*) in cases where there has been a positive Wassermann reaction in the cerebro-spinal fluid and pleocytosis at one time, which had later become negative on treatment, and where there had never been clinical signs of involvement.

Mr. MILLS, in his reply, laid emphasis on the necessity for cerebro-spinal fluid examinations in all cases of syphilis, beginning early. He thought that when a minimum of 4 g. of "606," or an equivalent amount of "914," together with mercury, had been given, it was desirable to test the cerebro-spinal fluid six weeks later, which was a critical and important time. If this test was negative there was no need to repeat it for at least a year. If the cerebro-spinal fluid had once been positive, a specimen of fluid should be taken after each follow-on course.

GONOCOCCAL VACCINES.

In the afternoon of the same day a paper on the Employment of Certain Constituents of the Gonococcus in Treatment and of Other Constituents in Tests of Cure was given by Major E. C. LAMBKIN (R.A.M.C.) and Major LYN DIMOND (R.A.M.C.). For the last two years, they had been endeavouring, at the Royal Herbert Hospital, Woolwich, to elaborate a line of treatment of gonorrhœa in the male by intensive immunising methods. The aims of the treatment were: (1) to raise the immunity of the mucosa through which the organism entered the body; (2) to raise the resistance of the particular glands and organs susceptible to attack by the gonococcus; (3) to raise the antibacterial properties of the blood and tissue fluids in order to minimise the risk of systemic spread of the infection; (4) to bring the patient under certain precise biochemical and colloid-chemical conditions which had been found to give optimal results as regarded defence against the invading organism and to place the infecting organism under conditions in which it was least able to withstand the defence mechanism of the body; and (5) to provide a test of cure. These objectives had been sought in the following ways. (1) Thorough drainage of the whole urethra by mild irrigating fluids. (2) Maintenance of the patient's urine reaction at a pH of 7·2 to 7·4. (3) Intra-urethral instillation of a product of gonococcal metabolism, referred to as "exotoxin." (4) Parenteral administration of this exotoxin. (5) Instillation into the urethra of another gonococcal product,

referred to as "endotoxin." The procedure advocated for drainage was posterior irrigation, carried out by the patient, with a solution of potassium permanganate 1 in 20,000. The hydrogen-ion concentration of the urine within the desired limits was effected by the oral administration of large doses of disodium monohydrogen phosphate, averaging gr. 240 four times a day. The reaction was determined roughly by daily titrations of the urine.

Gonococcal Exotoxin.—By special cultural methods it was found that when gonococci were grown on a medium rich in animal nucleoprotein, approximately one-third of the isolated strains developed polar bodies which could be demonstrated histologically by staining methods identical with those employed in the case of *Corynebacterium diphtheriæ*. The polar bodies were composed of alpha-nucleo protein and beta-nucleohiston, and clinical experiments had shown that both these, especially beta-nucleohiston, were antigenic and relatively non-toxic. Separation of the polar bodies was effected either by the employment of human serum or with 2 per cent. saline solution, the former being the least wasteful method. For intra-urethral use the saline or serum washes were standardised so that the nucleoprotein of 500,000 million organisms was contained in 15 c.cm. To this was added 5 per cent. sodium taurocholate and the reaction brought to a pH of 7·2. For intradermal, subcutaneous, and intramuscular administration the same serum or 2 per cent. salt emulsion of polar bodies or their products was used, but standardised to represent 1000 million per c.cm.

Gonococcal Endotoxin.—To prepare this strains were used which did not throw out the polar bodies employed in the exotoxin preparations—i.e., roughly about 66 per cent. of those isolated. The culture after treatment yielded a product of albumoses which was made up to a strength representing the product of 250 million gonococci in 1 c.cm., the diluent being chemically prepared colloidal silon. The effect of an intraurethral injection being to produce in a quiescent gonococcus carrier a temporary activity, with the appearance of gonococci in the urethral discharge, the endotoxin used in this way acted as a test of cure, but was also used in certain cases to stimulate a reaction in the course of treatment.

With regard to the clinical application of the treatment the speakers said that as soon as a case was diagnosed routine local treatment was begun, consisting of irrigation, followed by an intraurethral instillation of exotoxin which the patient was instructed to retain as long as possible. At the same time intradermal and intramuscular injections of the vaccine were given, each with an initial dose of 0·2 c.cm., or 200 million gonococci. In an average case the injections were repeated at ten-day intervals, the intramuscular dose being gradually increased. The intraurethral instillation was repeated as soon as the pH of the urine became optimal, and subsequently, whenever urethral smears showed the presence of gonococci, throughout the course of the disease. When a cure was clinically obtained, an intraurethral injection of 1 c.cm. of endotoxin was given. If no relapse then occurred after seven days' observation the patient was allowed to leave hospital.

In the last part of their paper Major Lambkin and Major Dimond referred to the question of polar body production in organisms other than the gonococcus—e.g., in tubercle bacilli (bovine), staphylococci, streptococci, pneumococci, and *Bacillus influenzæ*. As in the case of the gonococcus, if vaccines had been cultured upon media providing for detoxication during the period of subculture, and if means were taken during the process of manufacture of the vaccine to prevent further development of toxin, it was noteworthy that there was a complete absence of the negative phase following the administration of such vaccine, as compared with the marked negative phase resulting from vaccines prepared from strains which did not produce polar bodies. They suggested the possibility that in administration of vaccines the negative phase might be due to the liberation of endotoxin from the early digestion of the cytoplasm of the organism, the positive phase occurring later as a result of the liberation of the antigenic complexes present in the polar body fraction of the organism. If this was a true explanation, the negative phase occurring as a result of vaccine administration did not appear to be necessary to the development of the ameliorative positive phase—a conclusion which was confirmed by the fact that it was possible with properly detoxicated polar body producing strains of all organisms to bring about immediate positive phases with clinical improvement. This had been their experience after 18 months' employment of the toxin-free gonococcal vaccine, provided every precaution was taken against the elaboration of endotoxin during manufacture.

Colonel HARRISON said that early publication of a method involved a risk that, if it did not fulfil the hopes at first entertained, some discredit might fall on the authors. He wished, therefore, to say that he had induced Major Lambkin and Major Dimond to publish their work though they themselves regarded it as too immature. He wanted to increase the number of workers in this new line of vaccine therapy. The workers in his department at St. Thomas's Hospital had reached the productive stage so recently that he could not yet say much about results. Dr. J. O. Oliver had inoculated a number of non-gonococcal subjects, and had found that the complement fixation reaction of their sera was raised from negative to strongly positive by only three injections of the vaccine, so that it appeared to be antigenic. There had been one brilliant result in a case of gonorrhœa which cleared up in a few days and had so far not relapsed in spite of attempts to provoke a return. The other cases treated on the Lambkin-Dimond plan had behaved much as the average of the Woolwich cases. In all of them the discharge had ceased more quickly than usual though there had been some relapses.

The PRESIDENT said that he had long felt that gonococcal infection must be approached through the blood stream as well as locally.

Major LAMBKIN, in the course of his reply, said that probably any polyvalent vaccine was a toxic vaccine.

The PRESIDENT (Mr. DAVID LEES) then opened a discussion on

THE PLACE OF BISMUTH IN THE TREATMENT OF SYPHILIS.

He began by summarising the observations he had made on the treatment of over 6000 cases with bismuth. In some of these cases bismuth was the only drug used; in others it was used in combination with drugs of the arsenobenzol series and with tryparsamide; in others, again, it was administered with mercury and some form of iodide. A large number of different bismuth preparations were available, but the preparation which, in Mr. Lees's view, gave the most consistently good results with the least likelihood of upsetting the patient was one of insoluble bismuth in a very fine suspension in isotonic glucose solution, given intramuscularly. Administered in this way the injections were remarkably free from pain and from toxic side-effects, and in this respect bismuth was better tolerated than either arsenic or mercury. Although bismuth was more rapid than mercury in its destructive action on the *Spirochæta pallida* in vivo, it was not so rapid as the salvarsan group of drugs. After the administration of a potent dose of an arsenobenzol product, a living spirochæte could rarely be found 24 hours later in the surface lesion, whereas after a potent therapeutic dose of almost any bismuth preparation spirochætes could often be demonstrated for three or four days subsequently. In its effect on the surface lesions of syphilis in all stages, however, bismuth was almost as efficient as the salvarsan preparations, and was much more rapid than any of the mercurial preparations. In three of his own cases, each of which was in the nature of a hypertrophic papular syphilide of a recurrent type, the administration of bismuth rapidly cleared up the eruption when arsenic in one case, and arsenic and mercury in combination in the two others, had previously failed to do so. The effect of bismuth on the serological reactions in all stages of syphilis was less marked

than that of the arsenobenzols, but more marked than that of mercury.

Mr. Lees was firmly of opinion that in the treatment of syphilis in all its stages, except possibly in pregnancy, it was advisable to administer arsenic and bismuth together rather than separately. The joint administration of these drugs was comparatively safe and was well tolerated, while the results in the large majority of cases were highly satisfactory. Other advantages in the use of bismuth were that it was peculiarly effective and safe in most of the cases which showed intolerance to the arsenicals and to mercury; that in some cases of neurosyphilis and congenital syphilis it apparently gave better results than either arsenic or mercury in clearing up the symptoms and signs of disease; and that it was also undoubtedly a safer means of treatment of any patient with advanced organic disease, whether the latter were due to, or was intercurrent with, syphilis. It was important, however, in his view, that in every case of syphilis in its earlier stages a combination of either arsenic or bismuth, or arsenic and mercury, should be given, and that this combination should be continued up to the point of tolerance until both the clinical and the serological manifestations were cleared up. In the subsequent period of treatment he thought both drugs should still be continued, but the amount of the arsenical drug might then be conveniently lessened, with a view to avoiding intolerance. In any case, apart from cases of intolerance to other drugs, bismuth, valuable as it was, was only an adjuvant to the treatment of syphilis, and should not be used alone, even in the very earliest cases of infection.

Dr. J. C. BUCKLEY (Nottingham) considered the introduction of bismuth in treatment of syphilis second only in importance to the discovery of the arsenobenzols. In one case of his, that of a boy with interstitial keratitis, the condition grew worse after 5·5 g. of novarsenobenzol. Then intramuscular bismuth was given, and improvement took place quickly. The practice of giving the drugs separately, one after the other, as advised in America, had not worked well in his clinic. Dosage was a difficulty; in his experience a blue line occurred on the gum after 2 to 3 g. of bismuth.

Dr. MARY MACNICOL (Edinburgh) regarded bismuth as only an adjuvant to the arsenobenzols, but would certainly give it second place in treatment and relegate mercury to third place. She had found it useful where the Wassermann reaction remained positive after prolonged courses of novarsenobenzol and mercury. She had found that cases of congenital syphilis while clearing up well clinically on arsenic and mercury kept a positive Wassermann reaction until bismuth was exhibited.

Colonel E. T. BURKE (Manchester) said that in his view bismuth was only second in value to arsenobenzol, and was far superior to mercury. For more than two years he had entirely discarded the use of mercury except in those comparatively rare cases which exhibited an absolute intolerance to every arsenical preparation. In such cases, however, bismuth was used instead of arsenic in conjunction with the mercury. He agreed with Mr. Lees that bismuth should not be employed as a substitute for arsenobenzol in the average routine case, but rather as a reinforcement. He believed, however, that these two highly spirochæticidal drugs should not be administered concurrently, owing to a very real danger either that the tissues of the patient might refuse to produce the lethal toxalbumin in sufficient quantity, or that the *Spirochæta pallida* might acquire a resistance to the action of the toxalbumin. With regard to both arsenic and bismuth therapy, it was essential to bear in mind that the curative agent was produced by the tissues into which the element had been introduced, the blood being merely the distributor of the toxalbumin produced by the tissues. The fact that arsenic and bismuth belonged to the same group in the periodic table might be significant; there was a possibility that one might have a neutralising effect upon the other. So far as he could judge, it was more scientific to give arsenic and bismuth in alternate courses, since in this way the spirochæte was not allowed time to develop an immunity to either. Another valuable property possessed by bismuth was its effect upon syphilitic lesions of the circulatory mechanism of an organ. It was not unusual to see cases in which the administration of arsenobenzol for syphilitic involvement of the coronary arteries had brought about such rapid healing that the vessels became sclerosed so quickly as to prevent compensations. In syphilitic, coronary, and aortic root disease it was wise to withhold arsenobenzol and to begin with a prolonged attack with bismuth, or even, if the involvement was very severe, to continue with bismuth alone. It was, he thought, a sound general principle to withhold arsenobenzol in the presence of an acute syphilitic process in an important organ until the virulence had been considerably reduced with bismuth. For the same reason in newly born syphilitic children he began with bismuth inunctions, the preparation used being suspensol bismuth cream, in which the element was in its colloidal form. So far the results appeared to be immeasurably better than with mercury and as good as with arsenic. He had also found bismuth of great use in the treatment of interstitial keratitis, arsenic being administered only after the eye condition had cleared up.

Dr. W. R. SNODGRASS (Glasgow) said that his experience with some 2000 cases of syphilis led him to agree in the main with the conclusions of Mr. Lees. Bismuth had, however, only been on trial for five years, and the ideal preparation for use had not yet been determined. From his own personal experience he agreed that for general use metallic bismuth in isotonic glucose solution was undoubtedly the most satisfactory preparation so far available. All the resources of modern chemotherapy should now be employed to determine whether the best results would come from attempts to increase the tolerance of the body to metallic bismuth, or from the manufacture of some chemotherapeutic drug which would give an enhanced effect. A systematic attempt had been made during the last three years to synthesise a product more active than the metal, but although three drugs had been found to give good clinical results—bismuth gluconic acid, bismuthyl saccharic acid, and the sodium salt of bismuthyl saccharic acid—they had so far failed to improve on the metal. Other lines of research might also be followed—e.g., the pharmacology and toxicology of bismuth, its spirochæticidal action, its effect on the immunity of the body, and its toxic effects. The quantity of a standard bismuth preparation necessary to effect and maintain a clinical and serological cure might be carefully worked out. The time-factor was also of great importance. No final conclusions could as yet be drawn about bismuth, and caution was needed in regard to the criteria of cure. Further serological work might alter the points of view. Up to the present he had noted serological relapses and the development of neurosyphilis during treatment with bismuth. He employed the drug in combination with salvarsan or its substitutes, and/or iodides given either orally or intravenously. He also used it extensively in periods intervening between other drugs. In only a few cases of latent syphilis nothing but bismuth had been employed throughout an extensive period of time, these cases so far having yielded equivocal results. He thought bismuth was most helpful in cardiovascular syphilis, neurosyphilis, visceral syphilis in the absence of massive gummata, syphilis in debilitated individuals, and in those who had some concomitant degenerative process, or some coexisting subacute infective condition. No case of syphilis treated by bismuth at the clinic of the Western Infirmary of Glasgow had yet been discharged.

Colonel HARRISON said that there was a danger that a greater therapeutic power might be attributed to bismuth than it really possessed; in early cases its use to the exclusion of arsenobenzol might easily

result in the patient remaining infective unnecessarily long. He therefore felt critical, though bismuth was being used at St. Thomas's Hospital almost exclusively in place of mercury. More work was certainly needed, in particular to determine the best dosage and the best chemical compounds. Experiment indicated that bismuth either restrained the spirochætes from developing or prevented the tissues from reacting. There was quite a lot of work to show that bismuth destroyed the spirochætes in the tissues, but judgment should at present be suspended. Bismuth seemed to be better tolerated than mercury, but it was well to remember that there were other signs of intolerance than stomatitis and albuminuria. Some patients complained of curious aches and pains; these might easily be attributed to any other cause than metallic poisoning, but they came to an end when the remedy was stopped and sodium thiosulphate was administered. Another toxic effect was colitis, which had been clearly due to bismuth in one of his cases. Although bismuth did not seem to irritate the skin unduly, he had seen at least one case in which it lit up a dermatitis in a patient who had formerly suffered from this complaint following arsenobenzol treatment. Nevertheless, he liked bismuth particularly well for the treatment of neurosyphilis and of cardiovascular syphilis, and also in cases where he thought that enough arsenobenzol had been administered and where he wanted to give what Dr. Burke had described as an arsenobenzol holiday. He did not agree with Dr. Burke in relying entirely on bismuth in cardiovascular syphilis. Whilst admitting that such cases—particularly those of myocarditis—required great care in the administration of arsenobenzol, he had found that such a remedy as sulfarsenol, in very small doses twice weekly, gave good results in severe syphilitic myocarditis.

Discussing the comparative effect of bismuth and mercury on the serum reactions, Colonel Harrison described two series of sero-positive, primary, and early secondary (up to and including the lenticulo-papular stage) cases, both of which received about the same amount of arsenobenzol (5 g. of "914" in not less than four months). In addition to this the mercurial series received not less than gr. 6 of mercury by intramuscular injection, and the bismuth series received an average of 3·6 g. per case. The serological results were as follows:—

N.A.B. + Mercury Series: 158 *Cases.*

15·8	per cent. were	++ or +	at end of course.
8·8	,, ,,	doubtful	,, ,, ,,
75·3	,, ,,	negative	,, ,, ,,

N.A.B. + Bismuth Series: 124 *Cases.*

12·1	per cent. were	++ or +	at end of course.
15·3	,, ,,	doubtful	,, ,, ,,
72·6	,, ,,	negative	,, ,, ,,

From this it would be seen that although there were fewer frankly positive reactions at the end of the course in the bismuth series, there were also fewer cleanly negative ones. The comparison was not strictly fair, but the cases were as nearly as possible in exactly the same stages in both series; these stages were quite susceptible to treatment, and the amount of arsenobenzol in both series was the same.

Dr. STOPFORD TAYLOR (Liverpool) said that it was extraordinary that a drug like bismuth should produce toxic reactions. He had had one patient who was given arsenic and bismuth and developed diarrhœa, a morbilliform rash, and gingivitis. On stopping the bismuth the condition had cleared up. He did not believe that the blue line on the gums contraindicated administration of bismuth, provided Milton or some similar gargle were given.

Dr. W. H. BROWN (Glasgow) wondered if cutaneous eruptions during administration of bismuth might be due to retained depots of bismuth, causing a sort of sensitisation. He considered that arsenic followed by bismuth, but not the two together, was the ideal method of medication.

Reviews and Notices of Books.

JERVIS ON CORONERS.

Seventh edition. Edited by F. DANFORD THOMAS, Barrister-at-Law, Coroner for the Liberty of the Tower of London. With an historical introduction by F. J. WALDO, M.A., M.D., Coroner of the City of London and Borough of Southwark. London: Sweet and Maxwell. 1927. Pp. xvi. and 364. £1 1*s*.

HIS brother coroners will give a warm welcome to Mr. Danford Thomas's new edition of "Jervis on Coroners," first published by Sir John Jervis nearly a century ago and last revised in 1898. Dr. F. J. Waldo's historical introduction is accurate and in every way admirable. Mr. Danford Thomas has collated the various Acts, rules, and orders, and has added explanatory notes judiciously. He has, for example, an excellent summary of what coroners call "no inquest cases"—cases now governed by Section 21 of the Act of last year. These are explained to be of two classes. The first comprises those deaths where no post-mortem examination is ordered, the medical attendant of the deceased giving the certificate of the cause of death with the coroner's permission. In this class come sudden deaths in the street or in a public conveyance or hotel where medical knowledge of the deceased during life provides a natural cause of death; deaths in private houses where the doctor in regular attendance may not have seen the patient recently, perhaps through absence on holiday of doctor or patient; and deaths in mental institutions or in those cases which must be reported to the coroner in accordance with law. Here the coroner, after full inquiry by his own officer, may—if he is satisfied that there are no circumstances of suspicion—signify to the doctor that he sees no objection to the certificate of the cause of death being given as the latter suggests. The coroner then sends the "pink form A" to the registrar, who thus becomes aware that the coroner has been informed of the death. The second class of "no inquest cases" is that in which a post-mortem examination is ordered under Section 21, and the coroner sends the registrar (upon the "pink form B") the cause of death as disclosed by the report of the examination. Here, as Mr. Danford Thomas rightly remarks, a grave responsibility is thrown upon the coroner, who will doubtless make careful inquiries through his officer of all the circumstances, and who will have familiarised himself with the character, attainments, and reputation of the medical practitioners of his district.

Other passages in which the learned editor has made helpful comments are those dealing with medical privilege, deaths under medical treatment, and deaths from or under an anæsthetic. A valuable feature of the book is the collection of Home Office circulars which contain much that the medical profession—if not, indeed, also the general public—is entitled to know. The recent statutory rules and orders appear to be printed *in toto*, though the Orders in Council of July 25th (which bring to an end the Admiralty coronership and the royal right of appointment in the Isle of Wight) were issued too late to be included. The Cremation Regulations of last May, which have their place in the network of arrangements to prevent foul play being undiscovered, seem not to be prominently mentioned and explained as part of the new machinery; but they are referred to in a separate passage dealing with cremation. If so small a point may be mentioned, the chapter number of the Burial of Drowned Persons Act of 1808 might preferably be printed as 48 Geo. 3 c. 75 rather than as c. lxxv., which suggests a local Act; and in connexion with this statute it might be worth while to explain that the overseers are now abolished and their powers transferred elsewhere. But these are trivial matters hardly to be named where there is so much to praise. Nor should a review of the new "Jervis on Coroners"

appear in the pages of THE LANCET without a reference to the frontispiece, which shows Thomas Wakley, M.P., coroner for West Middlesex from 1838 to 1862 and founder of this journal, holding a parish inquest, with Charles Dickens (who occasionally attended his courts) standing by his side.

SCIENTIFIC NUTRITION IN INFANCY AND EARLY CHILDHOOD.

By STAFFORD MCLEAN, M.D., and HELEN L. FALES, B.S. New York. Philadelphia and New York: Lea and Febiger. 1927. Pp. 404. $3.

THE authors of this book have made a worthy contribution to an important side of literature. They have succeeded in combining a scientific treatise on the physiology of nutrition in the young, with a lucid and comparatively simple account of the various methods by which the physiological principles can be applied. The greater part of the book is devoted to the normal child or to minor disturbances, marasmus being treated rather shortly. The point of view that is held and stressed by the authors is that the calorie requirements of undernourished children are higher than those of the normal; they advocate a larger allowance of nourishment than is frequently given, and they attribute the success obtained by concentrated feeds such as butter-flour to the psychology of the pediatrist, who habitually prescribes them in amounts which give a higher calorie intake than they would offer in simple dilutions. The last part of the book deals with some digestive disturbances and the chemical pathology underlying them. The account of cœliac disease differs in some respects from that accepted by most English pediatrists. The authors recognise two types of cases: (1) those who are allergic to cow's milk and merely require its withdrawal, and (2) those who show intolerance to carbohydrate rather than to fat, the last type comprising the majority. A useful compendium contains numerous details of calorie values and feeding formulæ.

PHYSICS.

A Short History of Physics. By H. BUCKLEY, M.Sc., F. Inst. P., Hon. Secretary of the National Illumination Committee of Great Britain; Assistant in the Photometry Division of the National Physical Laboratory. London: Methuen and Co., Ltd. 1927. Pp. 263. 7*s.* 6*d.*

IT is 50 years since a book on these lines was attempted and the time is opportune for such a historical survey. The author is to be congratulated on the clever way he has arranged that the sequence of his subject matter fits into the chronological order of scientific facts. This arrangement has been so successfully accomplished that, although the reader passes in successive chapters through the Corpuscular and Wave Theories of Light the Atomic Theory of Matter, the Elastic Solid Theory of Light Magnetism and Electricity, and so on, he nevertheless feels an orderly sequence running through the whole text. The book is attractively written, with numerous quotations from the classics of scientific method. It is not complicated by mathematics, but sufficient references are to be found to original works dealing with this aspect of the subject. The book should be widely read, for the work is admirably done.

Spectroscopy. Third edition. By E. C. C. BALY, C.B.E., M.Sc., F.R.S., Grant Professor of Inorganic Chemistry in the University of Liverpool, Fellow of University College, London. In four volumes. Vol. II. London: Longmans and Co. 1927. Pp. 398. 18*s.*

WHEN the first volume of Prof. Baly's work appeared it was stated that the subject would be completed in Vol. II. We are now told that Vol. III. and Vol. IV. will follow. If, however, the subject is treated in Vol. III. in the same detail as in Vol. II., a continuance of this geometrical progression must be anticipated. The volume under review contains only five chapters—one on interference methods, one running into no less than 123 pages on methods of illumination, and one on the nature of spectra, fluorescence and phosphorescence, and the photography of the spectrum. The work should prove an invaluable reference book; it keeps up the high level expected of the author who does not seem daunted by the vista of work before him.

The Mechanics of the Atom. By MAX BORN, Professor in the University of Göttingen. Translated by J. W. FISHER, B.Sc., Ph.D., and revised by D. R. HARTREE, Ph.D. London: G. Bell and Sons, Ltd. 1927. Pp. 317. 18*s.*

THIS book may be looked upon as a counterpart to "The Structure of the Atom," by Prof. Andrade, who is the editor of this, the second book of the series of "International Text-books of Exact Science." Whereas in Prof. Andrade's book the purely physical aspect of the subject was insisted upon throughout, in this book the approach is rather from the mathematical side. This is inevitable where different types of motion have to be scrutinised, perhaps invented, to see to what extent they can satisfy the phenomena which appear when atomic structures are put into motion. The outstanding problem to be solved is the nature of the motion that the atom in its component parts must have to account for all the varied phenomena which have been revealed in the last 25 years. We hardly know which most to admire, the ingenuity of those who have devised experiments to glean the facts or the subtlety of suggestion underlying the efforts of the mathematician to explain the phenomena observed. This book gives a good idea of the range of this side of the work, and should be studied by those whose knowledge of mathematics is fairly advanced.

JOURNALS.

JOURNAL OF INDUSTRIAL HYGIENE, August.—Three articles of some importance appear in this issue of the journal. The first deals with the occurrence of tuberculous silicosis among granite workers in United States. Dr. W. McFarland, the writer, is a medical officer and writes with intimate knowledge of the industry and of the condition induced by exposure to dust among the men; about one-third of the granite is composed of quartz or silica. The article is illustrated by eight good X ray pictures. Disagreement is stated with the thought that tuberculous silicosis is less infectious than ordinary pulmonary tuberculosis. The second article, which comes from the Harvard School of Public Health, is in continuation of prolonged research into the toxicology of zinc, and deals with threshold doses which will cause metal-fume fever or brassfounders' ague. A formula is arrived at for expressing these threshold doses of zinc oxide. No cumulative pathological condition seems to follow long industrial exposure to zinc fumes. The third and longest article is concerned with the manufacture of electric accumulators and with risk therefrom of lead poisoning. The author is Dr. A. Hamilton, who has inspected the industry in America, in Great Britain, and in Germany; she describes and contrasts the technical processes involved and the risk in the different countries arising from inhaling dust of oxides of lead. The risk can be avoided by care and forethought, which is exerted in Europe through enforcement of regulations by skill inspectors. In the United States such expert supervision is not yet being exerted, and superexcellent conditions (due to individual initiative) may be found in one factory to be counterbalanced by a shocking lack of all care in another. From this point of view the article is one of great interest.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 10, 1927.

DE OFFICIO CORONATORIS.

THE publication of a new edition of "Jervis on Coroners" is an event not to be passed over in silence. That classic work, which we review on another page, partakes of the immortality and indispensability of the office which it describes. Its present re-issue was made necessary by recent changes in the law—changes so clearly desirable that even an independent legislative body like the Parliament of the Irish Free State has adopted them freely for its own administrative purposes. The new laws are already at work in England, tightening up the machinery for the registration of deaths and protecting the public by more closely supervising the disposal of dead bodies. Minor changes are making themselves felt. Franchise coronerships are beginning to disappear; the Admiralty coroner has been abolished; His Majesty has relinquished his right of appointing a coroner for the Isle of Wight; and the same process will gradually be applied as vacancies occur in the Duchy of Lancaster, which possesses scattered franchises wherever John of Gaunt planted a castle and established an area of peculiar jurisdiction. Amongst other useful administrative provisions which were enacted in the Coroners (Amendment) Act of last year will be recalled the power to accept the verdict of the substantial majority of the jury, the power to invite specially qualified practitioners to make post-mortem and special examinations, the arrangements for avoiding unnecessary inquests and for ending the duplication of criminal investigations when a coroner's court and some other court are pursuing parallel inquiries into the same death.

All these recent changes in the law, which increase rather than restrict the service of the coroner to the community, preserve the continuity of an ancient institution in true British fashion. Coroners were established—or at least their duties were defined—as early as 1194, when they first appear as keepers of the King's pleas. They have shed, it is true, some of their antique functions in the passing of the centuries. They no longer exercise the larger criminal and even civil jurisdiction which was theirs in the Middle Ages. They are no longer concerned with inquiries into the various royal interests in wrecks and sturgeons, the forfeiture of felons' chattels and the confiscation of deodands. Malefactors can no longer take sanctuary in a church; so it is no longer necessary to summon the coroner to parley with them and put them to the choice of either submitting to trial in the courts or undergoing the picturesque alternative of abjuring the realm.

But the chief duty of the coroner remains to-day, as it was in the beginning, the holding of inquests on the bodies of persons who have died by violence or accident or in suspicious circumstances. BRACTON'S famous treatise, transcribed in the apocryphal statute *de Officio Coronatoris* of 1276, laid down that duty in terms which are the foundation of our law to-day. The coroner is to go to the places where any be slain or dead (or where treasure is said to be found) and he is to inquire upon the oath of men of the vicinity if they know where the person was slain, whether it was in any house, field, bed, tavern, or company, and who was present. Likewise it is to be inquired who were culpable and those found culpable are to be taken and delivered to the sheriff and committed to the gaol. Being officers of the King and yet elected by the men of the county, the coroners formed a direct link between Crown and people; they were a check upon the intermediate lords. The coroner's court is essentially the people's court to-day. The neighbours can come and say their say without fear or favour; they play their part in the English scheme of public safety. As is natural in what is essentially a roving inquiry unconfined to narrow issues of the guilt of a particular person arraigned upon a definite charge, the inquest tolerates all kinds of evidence and sifts it for the purpose of the formal accusation which may follow. Presided over with tact and understanding, the court performs an essential service with singular success. As Dr. F. J. WALDO observes in the historical introduction which he has contributed to the latest edition of "Jervis on Coroners," the gradual growth of the coroner's office has beyond doubt made throughout the centuries a considerable contribution to the protection of the lives of our countrymen. We may add that the continued usefulness of that ancient office is a tribute not only to its own merits but to those of the men who have occupied it in the past and who occupy it to-day.

THE BACTERIOPHAGE.

THE phenomenon of bacteriophagy was brought into prominence about ten years ago by F. D'HERELLE, working at the Pasteur Institute in Paris. Credit is therefore due to D'HERELLE for his work and for his persistent attempts to elucidate the mysteries of the phenomenon which is commonly linked with his name. But, as with so many discoveries which break new ground, subsequent delvings into literature have shown that others had explored districts of the new territory and had examined portions of it, though none had succeeded in defining its outlines. F. W. TWORT, in this country, had described an analogous phenomenon which he encountered when engaged in certain researches upon ultramicroscopic viruses, and his name is consequently associated with that of D'HERELLE in descriptions of the phenomenon, although D'HERELLE maintains that the Twort phenomenon is a kindred but distinct one. This view is not shared by many bacteriologists, although few have attempted to reconcile the differences; in the history of pathology both workers are sure of credit. E. HANKIN, as long ago as 1896, discovered an elusive "antiseptic" principle in the water of the Jumna, manifested by its power of destroying many species of bacteria but especially the cholera vibrio; this action was destroyed by boiling, and he attributed it to a volatile body. It is now believed to be an instance of bacteriophagic action. Others noted the occasional occurrence of cultures whose early growth was succeeded by disappearance and dissolution of the organisms, an event which was vaguely dubbed autolysis, but seems to have attracted little attention after it had been named. Many such cases may have been examples of bacteriophagic action. Briefly, the phenomenon consists in the dissolution of bacteria when a substance, known as the bacteriophage, is added to a live culture which, in general, should be young and actively growing. This agent is widely diffused in nature and was discovered by means of an experiment, now classical, in which D'HERELLE added some filtered, and therefore sterile, fæcal material from a patient suffering from bacillary

dysentery to a tube of broth which had been inoculated with the *B. dysenteriæ* Shiga. Instead of showing a growth of the organism the medium after incubation appeared to be sterile. When a quantity of a fresh culture of the bacillus sufficient to produce a visible turbidity was added this disappeared after further incubation and the broth again became clear. D'HERELLE seized upon the idea that he had encountered "a virus pathogenic for the bacterium" and upon this assumption he proceeded to investigate the phenomenon further. Nothing that has happened since has served to shake his faith, and for him the dissolving principle is a living ultramicroscopic virus, a "filtrable organism parasitic of bacteria." The fact, paramount amongst many, which led him to this conclusion, and which has caused such intense interest to be taken in the bacteriophage, is that it becomes regenerated in the course of its action and the phenomenon of solution of the bacteria is capable of unlimited repetition in series. The destructive action can also be demonstrated in surface cultures where, when the active agent is suitably diluted, it produces round areas of bareness in the midst of a flourishing field of bacterial growth; these areas D'HERELLE has designated the "colonies" of the bacteriophage.

From the point of view of the general reader the subject raises at least two interesting questions; one is the real nature of the agent, and the other the possibilities of a practical application of the phenomenon. It is upon the first of these problems that most attention has been lavished and the dispute has been keenly waged without anything approaching general agreement having been reached. D'HERELLE has always stoutly stood for a living organism, abnormal and parasitic towards the bacteria with which it is associated and by means of which its presence is demonstrated. This is a thesis which, in the case of an invisible particle capable of apparent multiplication and regeneration is one not easy to attack, and although the attempts have been many they carry little conviction. The phenomenon has been attributed to autolytic enzymes, to a diseased condition of the bacteria induced by external influences—the "hereditary nutritional vitiation" of Bordet—and to the destructive action of particles of bacterial protoplasm; theories have been propounded by numerous workers with varying modifications, all more or less obscure since they strain mechanistic ideas to account for phenomena which are quite outside the range of common experience with chemical and physical factors. What are the criteria of life? The answer given by D'HERELLE is the possession of the properties of assimilation—the transformation of grass, by the sheep, into "sheep substance"—and adaptation. In the multiplication of the bacteriophage D'HERELLE sees the former—a view with which his critics may well disagree. As regards the power of adaptation there is general agreement that the substance is of a plastic nature and its virulence for bacteria can be augmented or altered; it shows also a definite adaptability towards other changes of external conditions. Prof. PRAUSNITZ, who after careful consideration adopts D'HERELLE'S view of a living organism, concludes, from the experiments detailed in the lecture published elsewhere in this issue, that the dimensions of the bacteriophage particles are in the vicinity of 20 $\mu\mu$; this is about a seventh of the size of the smallest known pathogenic microbe, that of bovine pleuro-pneumonia, and one-fiftieth of the diameter of the staphylococcus. In this estimate of size Prof. PRAUSNITZ is in close agreement with the conclusions independently arrived at by V. ANGERER by an optical method. He speculates whether so minute a body can carry out the complex functions of life. The dimensions given are well above those which theoretical calculations have shown to be the smallest at which life can be conceived to exist, and the experiments recorded upon the properties of the bacteriophage prove it to conform to the criteria which PRAUSNITZ sets up. One of these is the occurrence of random variability in the activity of the so-called organism, whilst the other is its adaptability to environmental alterations, a fact upon which D'HERELLE has likewise greatly insisted. Here the matter stands for the present. It is difficult to admit that such a phenomenon may be due to a living virus since it introduces a new conception. We have long been accustomed, quite irrationally, to regard bacteria as the smallest of living bodies limiting our purview to the accidental powers of the immersion lens and to shut out of our minds the possible existence of still smaller bodies leading individual or parasitic lives. Whatever the nature of the bacteriophage may ultimately prove to be, the phenomenon shows that large molecular groups upon the borderline of what we call life may possess some whilst lacking other of its attributes which we find so difficult to define.

The other and more immediately practical side of the problem is what functions, and especially what useful functions from man's point of view, the agent or organism may perform. D'HERELLE considers it utilisable in the treatment of bacterial infections and an important, if not the most important, factor in the rise and fall of epidemics. For him the decline of an infection, or the cessation of an epidemic, is in many cases due to the appearance of a bacteriophage active for the organism in question, which in a short space of time produces so great a mortality amongst these as to reduce them to impotence. He makes large claims for the termination of epizoötics by the introduction of a suitable bacteriophage amongst herds and flocks and for the treatment and cure of many types of human infections, more particularly of the intestinal ones, by such means. Here the outside confirmation of his results is exceedingly scanty and even in the favoured conditions of the test-tube the bacteriophage does not seem able to effect a *therapia sterilisans magna*. There are many other points in connexion with this fascinating subject upon which it is impossible to touch, such as the well-known decrease of bacteria in stored waters, the changes which occur in sewage, and the possible influence of so destructive an agent in ordinary bacteriological examinations. The many problems of this nature which await solution are intimately bound up with that of the essential nature of the bacteriophage, and here again the importance of pursuing what is sometimes rather depreciatingly called "academic research" becomes manifest.

STIMULANTS OF THE UTERUS.

WITH the end of August, 1927, comes the legal enforcement of a uniform strength for all preparations of pituitary extract sold in this country, an international conference, which met two years ago in Geneva under the presidency of Dr. H. H. DALE, having made arrangements for a common standard of reference to be adopted by all countries. The strength of the preparation is to be stated in units, the unit being defined as the amount of activity present in 0·5 mg. of the standard. The preparations on the market for the most part contain 10 units per c.cm.; if a

dose of 2 units is required the doctor must measure 0·2 c.cm. or 3·5 minims of the standardised solution. Now that uniform potency has been established by biological tests on uterine muscle, it remains to investigate and define the limits of safety in clinical dosage. This task has been attempted by the ideal combination for this purpose of an obstetric surgeon working with a pharmacologist. Mr. A. W. BOURNE and Dr. J. H. BURN have described in the summer number of the *Journal of Obstetrics and Gynæcology of the British Empire* (vol. 34, No. 2, p. 249) the results of joint investigations carried out at Queen Charlotte's Hospital. In order to obtain records of uterine pressure a rubber bag in the form of a hollow disc 1¾in. in diameter was introduced into the human uterus. The bag was stiffened just sufficiently to prevent it from folding over while being inserted into the uterus by a stout iron wire bent into a ring, and the end of this wire was passed through a gum elastic catheter which was attached to the bag. A piece of rubber pressure tubing 12 feet long joined the other end of the catheter to a recording manometer. By means of glass T pieces inserted in the course of the pressure tubing, and connected with a water reservoir and with hand bellows, the air in the bag could be displaced by water. It was found that this bag could be inserted into the uterus of the unæsthetised patient, between the edge of the os and the membranes of vertex, and gently pushed up along the postero-lateral wall without producing any ill-effects. The results of several observations on 13 women including 11 primiparæ were that in the majority of women in labour a dose of 2 units of pituitary extract is sufficient to produce a definite and sometimes a striking increase in the strength and frequency of the uterine contractions. The effect produced by the injection appears to be of two kinds. In five cases the uterus passed into a mild tonic contraction with superimposed waves of rhythmic contraction. In eight cases, including the multiparæ, there was an increase only in the force and frequency of the uterine contraction, the intermediate relaxation being complete. The records show that it was in cases where the os was not dilated more than enough to admit two fingers that the injection most often produced tonic contraction and that in these, with one exception, it did not produce rapid increase of dilatation; in fact, they provide evidence that the least advantage is obtained when the injection is made too early in the first stage. The observers conclude that where labour is prolonged owing to sluggish pains a dose of 2 units should be of value, provided that, in primiparæ, dilatation is nearing completion. The effect of repeated injections was not studied, but the progress of one case observed indicates that the repetition of injections more than once an hour is not likely to be of any value. As to the dangers of pituitary extract, Mr. BOURNE and his collaborator express conviction that these are due solely to excessive dosage. In their experience a dose of 2 units is safe in any stage of labour in all cases where there is no mechanical obstruction. It was possible to study the effect of administration of pituitary extract after delivery of the placenta in two patients. The uterus was already acting well in both cases and the action of large doses (4 to 10 units) was surprisingly small, but the effect on a flabby or atonic uterus might be much greater.

Practitioners will welcome this quantitative study of results based on graphical records, for where so many factors are concerned as in the estimate of the effect of a uterine stimulant the value of clinical impressions is not easy to assess. As regards pituitary extract pharmacologists and clinicians are at least agreed that the preparations in general use are potent. Not even this measure of agreement is to be found in reference to an older drug, ergot, which many generations of doctors have held to be a most valuable uterine stimulant. The effect on the uterus of the different physiologically active substances to be found in ergot has also been the subject of inquiry by Mr. BOURNE and Dr. BURN, and this part of their work is of especial interest in view of the conflicting evidence on the subject. Attention was called to the urgent need for correlation of pharmacological and clinical findings as to the active principle in ergot as long ago as 1922, at a joint meeting of those sections of the Royal Society of Medicine specially concerned.[1] At this meeting the value of ergot in obstetrical and gynæcological practice was discussed with special reference to its present position in the British Pharmacopœia. Briefly, the situation is as follows. In accordance with an international agreement as to the method of preparing liquid extracts, the popular official liquid extract of ergot has since the 1914 issue of the B.P. been a watery, whereas it was formerly an alcoholic extract. The extract as now prepared contains little or none of the specific alkaloid, ergotoxin. America has disregarded the agreement and retains the alcoholic extract. This difference of technique is of considerable importance in assessing results, since, whereas the preparation of ergot commonly used in America is one in which the specific alkaloid is retained, British practitioners favour an extract from which the specific alkaloid has been removed in the process of extraction. This anomaly has led to the suggestion that the clinical activity of ergot is due not to the specific alkaloid, but to the presence of the putrefactive bases tyramine and histamine. Some precise method of testing clinical impressions of the efficacy of the various constituents of ergot in stimulating uterine muscle was thus urgently required. Mr. BOURNE'S optimism, expressed at the meeting already referred to, that some useful results might be obtained from an instrumental method of gauging uterine contractions has been justified. Though he and his collaborator have been able to study with the recording apparatus only a small number of cases, their general conclusions have been confirmed by a controlled investigation of clinical reports on normal women in the puerperal state some of whom have been given ergot in different forms.

The results show that neither histamine nor tyramine in the proportions present in the B.P. liquid extract is responsible for the traditional value of ergot, though histamine in large doses (2 mg.) has a relatively powerful effect on uterine muscle. Ergotoxin has a definite effect, not like pituitary extract in intensifying the process already in being, but in the production of a condition of uterine spasm which, though dangerous so long as the child or the placenta remain in the uterus, is admirably suited to the needs of the puerperium. Ergotoxin does not act rapidly, but only in 20 to 30 minutes after hypodermic injection. It is therefore suggested by these observers that a mixture of the two drugs in the proportion of 2 mg. of histamine to 0·5 to 1·0 mg. of ergotoxin might be the ideal agent for the control of post-partum hæmorrhage. The final conclusion reached is that, unlike the official fluid extract of ergot of the U.S.A., the extractum ergotæ liquidum B.P. is a wholly inert preparation and that the pharmacopœial method of preparing the extract should be revised in order that the specific alkaloid shall be present in the extract.

[1] See THE LANCET, 1922, ii., 1274.

Annotations.

"Ne quid nimis."

CONTROL OF MOSQUITOES IN ENGLAND.

THE annoyance caused by the bites of mosquitoes is an aspect of their activities that has not received much medical notice. It is, however, a considerable nuisance in many parts of the country, and a few years ago it became so intolerable in Hayling Island that a campaign against the insects was started in 1920. Mr. F. W. Edwards, of the Natural History Museum, held that in prevailing conditions the brackish-water-breeding mosquitoes *Aedes* (*Ochlerotatus*) *caspius* or *A. detritus* was most probably to blame. The catching and identification of some thousands of the many millions of imagines, which packed every conceivable particle of cover, showed that the latter mosquito was almost solely implicated. The breeding-places, found nowhere in the residential parts, were finally traced, in 1921, to two saline marshes produced by seepage through the sea wall at high tide, and each situated about a mile and a half from the centre of the heavily infested residential district. Clearly, from the density of the insects, this considerable distance was well within the range of flight, affording a marked contrast to the habitual range of the malaria-carrying anopheles. On connecting marsh pools by ditches and emptying the whole system into the sea through sluice gates at low tide Hayling Island was rid of its nuisance.

It all seems delightfully simple, yet the result has actually been due to controlled and intensive research. This has included the collection and identification of thousands of imagines; the lengthy and at first fruitless search for their breeding-grounds; the identification of larvæ in the saline marshes; the determination of the degree of salinity of water in which they will breed (which was found to be as great as that of sea-water) and its hydrogen-ion concentration; the evaluation of larvicides—the usual suffocative petroleum film having been discarded for "a certain sanitary fluid containing 20 per cent. of soluble cresol," which kills in a strength of 1 in 28,000; the regular inspection of "water-places," a conveniently coined synonym for "potential breeding-places"; and, indeed, the collection of every possible scientific detail. All this was made feasible by the institution of the Hayling Mosquito Control with Mr. J. F. Marshall as honorary director and Sir Richard Gregory as chairman. Publicity and education were widely and wisely used. Hostility to the scheme was of course evident enough, and those who showed it had the satisfaction of the last word; for before it was started they pointed out that it could not succeed, and when it succeeded they said that it had been unnecessary.

By the end of 1924 the multifarious work of demonstration and research necessitated larger and more suitable premises, which Mr. Marshall erected at his own expense in the hope that the organisation would be placed on a permanent basis. Through the offices of Sir Richard Gregory, responsibility for the British Mosquito Control Institute was undertaken by a strong council, and about two years ago the building was opened by Sir Ronald Ross. A usefully illustrated report has now been issued covering the whole period. The Institute comprises a demonstration museum, a laboratory with apparatus ingeniously designed to fulfil its peculiar requirements, a photographic room including a specially lighted camera which for the first time reproduces with equal distinctness on the same plate the body-markings and the wing venation of mosquitoes, a library, administrative rooms, and other accommodation for such workers as avail themselves of the valuable opportunities which are here at hand. The scope of the Institute's activities has been widened to include experimental, educational, and research work in connexion with mosquitoes and other noxious insects particularly with a view to control. The directors aim at opening branches in other parts of the country, and wish to collect enough subscribing members to enable the Institute to carry on the work efficiently and to enlarge its usefulness.

THE RELATION OF TRAUMA TO THE LEUKÆMIAS.

TRAUMA is often cited as a factor in the production of hæmopathics. Their alleged causal relation often has to be considered in cases of compensation, and here the problem may be especially difficult, as in the life of most workmen it is easy to discover some history of injury preceding the illness more or less remotely. A case in the Roman law courts, in which a stoker was awarded damages for acute myeloid leukæmia on the ground that it was caused by a small burn of the second degree on the thigh, has led Prof. Salvatore Diez, of the University of Rome, to investigate the whole subject, and the results he has published [1] are interesting from a medico-legal point of view. He has examined all the reported cases, and offers some general considerations on the theoretical possibility that injury may affect the production, development, or course of the leukæmic syndromes.

Leukæmia is undoubtedly a disease of general distribution, not localised in this or that organ, nor apparently originating at any definite point in the hæmopoietic system; it involves the system as a whole, and the cause is presumably one that has a general action. It is difficult to imagine an injury having such an action; even serious damage to the spleen has not been found—except in a few doubtful cases—to give rise to leukæmia; and although both leukæmia and injuries to the skeleton and bone marrow are commonly reported, there is no sufficient evidence of a connexion between them. Thus from probabilities as well as from clinical observations it seems that only when a traumatic lesion is followed by a grave septicæmic process can any relation be maintained between the two conditions in a medico-legal sense. Even if it is admitted that trauma exercises an influence by diminishing the resistance of the organism, its action cannot be regarded as different from that of other agents which render the morbid cause more active and emphasise its effects. The question arises whether such intervention is required for development of the disease. Prof. Diez thinks that it is not. There are already, he says, in the organism the conditions necessary and sufficient to determine the morbid state; the trauma is merely a revealing element—one of those factors which call attention to it. Sooner or later the disease would manifest itself in any case, and the trauma, when the disease is already present, cannot be construed as an aggravation, since in industrial disputes this term implies a violent cause producing substantial modifications in the evolution of the disease such as could not otherwise be verified.

Would it not be right to speak of the relation between trauma and leukæmia as a coincidence? Prof. Diez has collected 30 cases of this supposed connexion, and has divided them into six groups: (1) Eleven cases in which the diagnosis seems erroneous or uncertain, where the data indispensable for sustaining the theory of a relationship are wanting, and which cannot therefore be taken into serious consideration; (2) two in which the long interval between the injury and the first manifestations of leukæmia exclude any relationship; (3) ten in which the very short interval between the trauma and death, or the manifestation, immediately after the injury, of a well-marked form of leukæmia, undoubtedly point to its pre-existence; (4) one in which causes other than trauma may have had an influence over the development of the leukæmia; and (5) six in which it would be hazardous to draw any conclusions for medico-legal purposes, as there was no proof that the disease was not present before the injury. Even slight experience of leukæmic

[1] Policlinico, Medical Section, August 1st, 1927.

affections brings a knowledge of the profound changes that may be present in the blood without functional disturbance, and rapid and progressive development of the disease does not in the least exclude pre-existence of the morbid process. Between the chronic cases and those which are apparently acute from the commencement are those—not very rare—in which the disease, after existing for a time without appreciably affecting health, suddenly begins to run a rapid course, with more or less rise of temperature and progressive deterioration in the general condition. The sudden change is probably due to diffusion or extension of the morbid process to important sections of hæmopoietic tissue, and the recognition of such forms has induced some observers to maintain that there is no ætiological difference between the very acute and the chronic leukæmias. In determining the possibility of a traumatic factor in the ætiology, it is necessary to be able to exclude other factors which can determine the development of the disease. This is difficult, as we are ignorant of what they may be. In the meantime, Prof. Diez considers that the reported cases offer no proof that leukæmia can originate from trauma.

KEY INDUSTRIES: THE CASE OF SPECTACLES.

UNDER the provisions of Section 1, Subsection (5), of the Safeguarding of Industries Act, 1921, and of Section 10, Subsection (4), of the Finance Act, 1926, complaints as to the improper inclusion of articles in, or their exclusion from, the lists of articles chargeable with duty under Part I. of the Safeguarding of Industries Act, as amended by the Finance Act, 1926, have to be referred for decision to a tribunal consisting of the referee appointed by the Lord Chancellor and of two persons selected by the Lord Chancellor from a panel of persons of special scientific attainments appointed by the President of the Board of Trade. The Lord Chancellor has appointed Mr. A. A. Hudson, K.C., to be the referee, and the President of the Board of Trade has appointed the following gentlemen to be the panel of persons of special scientific attainments: Mr. A. Chaston Chapman, F.R.S., Prof. F. G. Donnan, C.B.E., F.R.S., Dr. J. H. Jeans, F.R.S., Prof. F. A. Lindemann, F.R.S., Prof. S. Smiles, O.B.E., F.R.S., and Prof. J. F. Thorpe, C.B.E., F.R.S. The Board of Trade announce that they have received a complaint that spectacles, eyeglasses, and monocles have been improperly excluded from the lists of articles chargeable with duty under the Safeguarding Act as amended. The complaint will be referred for arbitration to a tribunal consisting of the referee, Dr. Jeans, and Prof. Lindemann, and any communications regarding this complaint should be addressed without delay to the Principal Assistant Secretary, Industries and Manufactures Department, Board of Trade, Great George-street, London, S.W. 1.

THALLIUM EPILATION FOR RINGWORM OF THE SCALP.

As a first step in the treatment of ringworm of the scalp it is desirable to remove all the infected hair. This may be done by exposure to X rays or by giving a single dose of thallium acetate, and for young children the second method has undoubted advantages. Thallium is a poison, and mild toxic symptoms often follow its administration. But although the drug has been widely used we are unaware of any case of fatal poisoning, and it seems likely that the treatment has come to stay. Obviously its use requires great care, as we pointed out [1] when the first results were published in this country by Dr. G. B. Dowling and Mr. R. Kelman.[2] The method was introduced in Ireland by Dr. Maurice Drummond,[3] and to the July number of the *Irish Journal of Medical Sciences* he contributes an article which should be useful to those who wish to try it for themselves. A paper by Dr. E. T. Freeman in the same journal is also worth perusal, whilst further comment will be found in the report of a discussion which we publish on p. 550. The chief conclusions which emerge are as follows: (1) the treatment appears to be safe when properly conducted; (2) it is very much cheaper and simpler than epilation by X rays; (3) the child need not be restrained and is never frightened; and (4) permanent alopecia does not occur. Though the technique is simple, the intending operator must faithfully observe the details of administration, which should never be left to a nurse or unqualified person. The contra-indications and the question of repetition of the dose require very careful consideration in every case, experiments at King's College Hospital[4] supporting Prof. A. Buschke's recommendation that a second dose should not be given within two or three months of the first. Administration by the mouth has hitherto been the rule, but Dr. H. C. Semon reports that hypodermic injection of the same quantities is equally effective.

[1] THE LANCET, 1927, i., 449. [2] Ibid., 1927, i., 389.
[3] See THE LANCET, 1927, i., 343.

HEALTH IN OUR FACTORIES IN 1926.

As read in figures of mortality and sickness caused by industrial accidents and diseases, the record for 1926, given in the annual report of the Chief Inspector,[5] is excellent; but its excellence has to be discounted by the extensive closing down of work during the year due to the coal stoppage. The tendency for the small workshop to give way to the larger factory has continued; as has also the tendency for industrial growth to be more rapid in the South-East of England than in the North and Midlands. Of particular industries the motor-car trade, sugar-beet factories, and tin-plate making were developing satisfactorily; but depression and short hours is the more usual story. The chapter dealing with accidents indicates the efforts being made to promote the adoption of safety-first methods; the results in every case are unchallengeable and of great economic value. Yet the methods spread slowly. Close investigations of the ways in which accidents occur continue to be made, and, as ever, reveal the paramount importance of the personal as contrasted with the mechanical factor. The substitution in metal grinding of abrasive wheels for sandstones continues, reducing at once dangers from bursting stones and from the dust hazard. The granting of compensation to metal grinders with silicosis is expediting this beneficial revolution. The position of the young person in industry receives special consideration; vocational selection on engagement, although far from general, is increasing; young persons are employed for the same hours as adults, but the number employed in dangerous trades is comparatively small. Labour-aiding devices more and more save them from heavy work beyond their strength; but posture at work is seldom considered, either in adjusting the height of the machine to the youth or of the youth by adjustable seats to that of the machine. The sports side of welfare is doing good service. Better instruction on accident prevention to youths is needed. The encouragement of dancing in the dinner-hour caused girls on monotonous repetition processes to work much better. Vocational and general continued education is found to improve craftsmanship and output. Some account is given in the report of advances made in labour-saving appliances—a fundamental factor in reducing unskilled labour and raising the standard of industrial employment and wages; in this direction lies advance in racial improvement. The greater the saving of strenuous and arduous labour, the more efficient and economical is work, and the less the risk of accidents. Dr. J. C. Bridge, who has succeeded Sir T. M. Legge, writes on matters essentially medical. When dealing with lead poisoning he points out that so long as lead is used poisoning will occur; only by use of non-toxic materials can poisoning be eliminated; and the

[4] THE LANCET, 1927, i., 129).
[5] Annual Report of the Chief Inspector of Factories for the year 1926. H.M. Stationery Office. 1927. Cmd. 2903. Pp. 139.

enormous advantage gained from use in the potteries of low solubility or leadless glaze is quoted. Four cases of tumours in the bladder occurred among aniline workers; poisoning from this source is much more frequent in warm than in cold weather. Notified cases of epitheliomatous ulceration due to occupation continue to increase in number; there were 187 with 49 deaths in 1926 as compared with 45 with one death in 1920 when notification was first demanded; mule spinning, 88 cases with 20 deaths, was by far the largest contributing source. Dermatitis among bakers is ascribed to manipulating dough, which is hygroscopic and breaks down the protective horny layer of the epidermis; here, as in other industries, cleanliness and meticulous attention to the skin is the great protective barrier. Several interesting inquiries are recorded, of which the distinctive feature, as against inquiries of past times, is the absence of serious findings; undoubtedly conditions of work to-day are less risky and more civilised. The use of electricity, which means greater risk from shock, continues to increase; but that no increase occurs in electrical accidents is a praiseworthy testimony to expert and skilled forethought in supervision of appliances permitted to be used.

CONCERNING LUMBAR PUNCTURE.

THE discussion reported on page 553 reveals a certain amount of disagreement about the readiness with which lumbar puncture should be done, whether for diagnostic purposes or for estimating the effects of treatment. Of its value for both these purposes there can be no question, but from the patient's point of view the operation is at best unpleasant, and however skilfully performed, it is not altogether free from the risk of uncomfortable after-effects. It is true that fear of the unknown accounts for most of the patient's aversion, and those who have been frequently punctured become almost indifferent; but the after-effects may undoubtedly be very trying, and if lumbar puncture were applied indiscriminately the proportion of cases in which troublesome sequelæ occurred would be considerable. As long, however, as it is confined to cases of organic (or suspected organic) nervous disease, and reasonable precautions are taken, the percentage of patients who suffer any serious discomfort is small. Disseminated sclerosis seems to render subjects particularly liable to rather prolonged headache after the withdrawal of even a little fluid; cerebellar tumours and cerebral tumours in certain situations provide a not inconsiderable risk of death if lumbar puncture is performed otherwise than with the greatest care; but in most other organic nervous diseases —neurosyphilis, meningitis of all kinds, encephalitis, poliomyelitis, spinal tumours, and the like—lumbar puncture is well borne and often gives relief. Where there is no organic nervous disease and no pathological change in the cerebro-spinal fluid, unpleasant after-effects, such as severe headache, nausea, and vomiting, seem to occur rather more often, and in doubtful cases it should always be considered whether the advantages outweigh the possible disadvantages. Syphilitic infection so often affects the central nervous system that it is certainly of some importance to know when changes of a syphilitic nature are present in the cerebro-spinal fluid, though the knowledge gained can make little difference to treatment as long as the Wassermann reaction in the blood is positive. Examination of the cerebro-spinal fluid may be advisable, as Colonel L. W. Harrison points out, when there is difficulty in rendering the blood Wassermann negative, and before any syphilitic patient is discharged from treatment.

The cause and prevention of the untoward symptoms that sometimes follow lumbar puncture are discussed in the *Presse Médicale* of August 13th by Dr. J. Mouzon, who considers that they are due either to hypotension or hypertension of the cerebro-spinal fluid. Hypotension may be brought about and sustained by the escape of fluid into the subdural space and tissues through the puncture in the membranes made by the needle, whilst hypertension is attributable to irritation of the dura, which reflexly stimulates production of cerebro-spinal fluid. In hypotension the symptoms come on at once but are less prolonged; they are often accompanied by muscular weakness, tachycardia with low blood pressure, and oliguria; the effect of posture on the headache is marked. In hypertension the onset is slower and the symptoms last longer; posture has little effect on the headache, and there may be slight mental confusion, and tachycardia without low blood pressure. As means of preventing symptoms after puncture, the head should be kept low and the hips raised by a pillow. All muscular effort by the patient should be avoided during the puncture and for some hours afterwards. When the needle is felt to be through the dura, but the fluid does not flow at once, the needle should only be moved slowly and cautiously after a short interval, and should not be hurriedly withdrawn and inserted again. The fluid often comes slowly at first; it should never be withdrawn quickly, and no more should be taken than is necessary for diagnosis. The patient should lie in the lumbar puncture position for 20 minutes and then be rolled slowly over on to his back. After a few hours his head may be raised with pillows and food can be given, and in 24 hours he may get up. With these precautions, according to Dr. Mouzon, most of the unpleasant sequelæ are avoided.

If these theories of the causation of symptoms are correct, it is clear that the smaller the needle used the smaller will be the likelihood of leakage of fluid, the less the irritation of the dura, and the slower the delivery of the fluid. A fine needle, however, is not strong enough to pierce the skin and ligamentous structures before the dura is reached, at any rate without risk of breaking. This difficulty is overcome by the use of a needle within a needle, the inner one coming into action only after the ligamentum subflavum is pierced. Such needles, Dr. Mouzon says, have been described by Antoni[1] and W. Wechselmann,[2] and he considers that their use greatly minimises the chances of unpleasant symptoms following lumbar puncture, even when the patient is allowed to walk about immediately afterwards.

HIGHER QUALIFICATIONS FOR CANADIAN PRACTITIONERS.

A RECENT editorial article in the *Journal of the Canadian Medical Association*, dealing with the development in population and importance of the Dominion, points out that such advances carry with them the necessity to raise the standards in all special social activities. Problems which have been solved or have solved themselves in the countries of older civilisation present themselves regularly to newer States, and for some years the question of the development of medical education in Canada has been a subject of particular interest to the Association. Two years ago the Association made representations to the Royal College of Surgeons of England upon the desirability of facilitating for Canadian graduates the attainment of the Fellowship. The representations made were to the effect that, as the expenditure of time and money required by the journey to London to sit for the examinations had a very deterrent influence on Canadian candidates, it was hoped that the College would devise a method by which examinations could be held in Canada. It may be remembered that the justice of the arguments of the Association was recognised handsomely by the College, and in a report from the Nomination Committee of the College upon the Primary Examination for the Fellowship, the following recommendation was made and adopted by the Council in May last: "That it is desirable to send examiners to the Dominions to

[1] Antoni: Ugeskrift f. laeger, 1924, lxxxvi.
[2] W. Wechselmann: Med. Klin., Dec. 18th, 1924 p. 1787.

conduct a Primary Examination for the Fellowship, of the same standard as the examination in this country, on conditions to be hereafter determined, provided that satisfactory arrangements can be made." The journal of the Association announces that in all likelihood this Primary Examination in anatomy and physiology will be open to Canadian undergraduates who have completed advanced courses in the subjects, as well as to qualified graduates, and it is hoped that the first examination may be held in Canada next summer. In the meantime Mr. S. F. Cowell, the secretary of the College, and Mr. F. G. Hallett, the director of examinations of the Conjoint Board, are conducting the necessary negotiations with the Canadian authorities.

QUARTERLY CUMULATIVE INDEX MEDICUS.

THE product of the fusion of the two most trustworthy journals of reference to medical and allied publications in the English, if not in any language, has taken an agreeable form. The first issue of the Quarterly Cumulative Index Medicus,[1] which has just reached us, is a handsome volume, light in weight, firmly bound and clearly printed. It contains for the period under review the names of the writers and the titles of the subject matter, indexed alphabetically, of all the contributions to all the general and special medical journals received in the library of the Surgeon-General's Office in Washington, and these include practically the whole medical literature of the world. In a valedictory foreword to the last (supplementary) number to be issued of the Index Medicus, the editors gave a brief history of the evolution of this work, which dates from 1879, whereas in the *Journal of the American Medical Association* of July 2nd the genesis of the younger parent, the Quarterly Cumulative Index of the American Medical Association (started in 1916), is set out. Those who habitually use either publication are well aware of their peculiar advantages; those who are familiar with neither may note that the last-named index of contributions to the more important periodicals was on the whole more convenient for current use, whereas the Index Medicus was more exhaustive. The duplication of labour and expense was recognised to be unnecessary and wasteful, and last year the new Quarterly Cumulative Index Medicus was carefully designed to combine the best features of the classification of both works. The index is alphabetical as to authors and subjects. The author's titles are now given in full in the original languages, with the exception of titles in the Slavic, Scandinavian, and Oriental languages, which are presented in English translation; the subject entries are brief English abstracts of the actual content of the articles in question, without references to the titles, unless the latter happen to be accurately descriptive. Cross-references are frequent. The new books published throughout the world during the half year are presented, for ready reference, both by authors and by subjects and with prices attached at the beginning of the volume. Incidentally these are less numerous than might have been expected—for example, only ten works appear to have been published on surgery, six of which are in the German language. It is not quite clear what practice is followed when a new edition is entirely re-written by living workers of a well-known classic, the original name being retained. An alphabetical list of publishers of the books and periodicals indexed (American and foreign) and an alphabetical list of all the periodicals indexed are also included. The number of current periodicals now coming into the Surgeon-General's library is about 1925. They include all important periodicals of anthropology, biology, psychology, and even those of chemistry, physics, and general science, which may publish articles bearing on medicine. Any unusual and noteworthy books or articles of this character not apt to be represented in regular medical channels will be included if sent to the Chicago Editor (American Medical Association). Immense labour is involved in the preparation of such an accurate and complete account of the world literature of our science. The American Medical Association and the Carnegie Institute, which bears a portion of the expense of publication, deserve the gratitude of medical workers in all countries.

[1] Vol. I., January–June, 1927. Chicago: American Medical Association. Pp. 840. $8.75 for two volumes.

PROTECTION AGAINST MEASLES.

NOT long ago Dr. J. E. McCartney reviewed in our columns [1] certain recent work on measles and referred to a green-producing diplococcus isolated by Ruth Tunnicliff and thought to be of ætiological significance in the disease. An antiserum made by injecting this organism into goats is said to protect children against infection, and Tunnicliff and White [2] now report similar results obtained with the serum of an immunised horse. Carbolised broth cultures of the diplococcus were injected into the animal at intervals of from three to seven days, and when a basal immunity had been obtained it was inoculated with living diplococci by the Dochez method. Further injections of killed whole broth culture and living organisms were made alternately. The serum from the several bleedings of the animal was pooled; part was concentrated by a modified Banzhaf ammonium sulphate method and the rest was used unrefined. The serum was found to contain opsonins and neutralised the diplococcus antigen used for cutaneous tests on rabbits and on human beings; it also protected mice against fatal doses of green-producing measles diplococcus. The effect on human beings has not yet been studied on a large scale. The unrefined serum, administered in doses of 5 c.cm. to five children on the fourth day after exposure to measles, protected one child, modified the disease in another, and apparently had no effect on the other three. In another series 10 c.cm. was given to each of four children on the fourth day after exposure, and one child developed unmodified measles. Of the concentrated serum 10 c.cm. was given to each of four children exposed to measles four days previously. Of these two escaped, one had mild measles 14 days after exposure, and the other contracted mild measles 30 days afterwards. These cases are too few in number for any conclusions to be drawn further than that the serum seems to give protection in some cases but not in others.

[1] THE LANCET, 1927, i. 93.

[2] Tunnicliff, Ruth, and White, B.: Boston Medical and Surgical Journal, August 18th, p. 272.

MEDICAL CANDIDATES FOR THE DAIL.

THE general election of the new Dail is to be held on Sept. 15th, and of the 260 candidates for 150 seats, 11 are medical men. Of these, Sir James Craig, one of the sitting members for Dublin University, has, with his colleagues, been returned unopposed. He sits as an Independent supporter of the Government. Of the remaining ten five are Government candidates and five are Fianna Fail. Mr. T. Hennessy, who was elected at a by-election only a fortnight ago, has again to contest his seat without having entered the Dail. His return for South Dublin City is, however, almost certain. Dr. Myles Keogh, another of the candidates for the same division, has hitherto sat as an Independent, but now comes forward as a Government candidate.

Sir Arthur Keith was able to announce on Tuesday last to the British Association that, in answer to his appeal to the public for the preservation of Downe House, the home of Darwin, he had received a telegram from Mr. Buckston Browne making himself wholly responsible for the national gift. No other contributions will be necessary. Mr. Buckston Browne's offer, which was gratefully accepted by the Association at the closing of its sessions, implies a gift to the nation amounting, with a certain endowment, probably to as much as £14,000 or £15,000; he has made the valuable suggestion that the office of curator of the premises should be given to a suitable medical man.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCXL.—THE TREATMENT OF G.P.I. (PARESIS; DEMENTIA PARALYTICA).

II. THE CHRONIC CASE.[1]

SOME cases of paresis which are not responsive to treatment, in spite of early diagnosis and the prompt application of the methods were outlined last week. Some patients continue to deteriorate slowly; others improve, but psychical defect remains, and they are not able to look after themselves or resume their work. There has also to be considered the patient who, by reason of some physical defect or age, is not suitable for the use of malarial therapy. Some of the slowly dementing forms of paresis present great difficulties to the practitioner. The patient has no insight into his condition, may show profound loss of memory, may have attacks of mild confusion, may be erratic and even dirty in his habits, and yet does not become so disordered in his conduct or speech as to justify a certificate of unsoundness of mind under the Lunacy Act. Yet for the majority of chronic cases certification and treatment as an in-patient in a mental hospital becomes necessary sooner or later. Nursing a chronic case at home or in a suitable nursing home involves considerable expense, since adequate assistance must be available. It can be done, and sometimes there is no alternative.

Treatment should ensure as much fresh air as is possible. The patient must always be accompanied when walking or driving. An effort should be made to provide some simple out-door amusement to interest him, for he will often pass many hours playing at some easy game. Bowls, clock golf, skittles, are among the games which are easily set out on the smallest patch of grass. In the later stages of enfeeblement care must be taken to see that the patient is not unduly exposed to the weather, especially when the wind is easterly. Patients become very liable to attacks of broncho-pneumonia as the disease progresses, and a fatal illness not infrequently follows a walk or drive in a cold east wind.

Diet.

The diet should be liberal, though care must be exercised to see that any tendency to gross overfeeding is checked. Practically all solid food must be minced; paretics choke themselves easily with meat, or with potatoes, which they often swallow whole. The supply of meat should be sparing, and it should be arranged that the chief meal be taken at midday. Bones must be removed from fish; eggs and milk should be given freely, and will form the greater part of the dietary in the later stages. The absolute avoidance of alcohol is a fetish. Indeed, many patients are better for 1½ to 2 ounces of whisky or brandy taken with the principal meal. All wines should be forbidden. Tobacco in moderation may be allowed.

Sleep.

Insomnia is rarely a feature of the chronic case of paresis. In practice it will be found that somnolence is much more usual. For this reason patients should be put to bed early; 8 or 9 P.M. is not too soon, and the patients often sleep the night through. The bedroom should contain very little furniture; linoleum is the best covering for the floor. A patient who is confused is safer on a box or spring mattress placed on the floor of the room. He may be even safer on a single mattress on the floor. The discomfort of this couch may be mitigated by placing under it a cork mattress, such as is sold in camp outfits.

Insomnia and restlessness at night may be relieved by a dose of castor oil. If this measure is not successful sleep can generally be secured by ordering 5 gr. each of the three bromides, 6 gr. of medinal, or 1 or 2 drachms of paraldehyde or amylene hydrate taken on retiring. The bowels must be kept functioning rather freely. Patients require larger doses of laxatives than the normal person. Castor oil should be given when there are attacks of irritability, restlessness, mild confusion, or excitement. An inspection and palpation of the abdomen should be made frequently by the physician in charge, with a view to detecting a distended bladder. A paretic in the advanced stages, or even before, will walk about without complaint with a very distended bladder. Retention, or distension without actual retention, is relieved by the use of a catheter, seldom necessary for more than one or two days.

Seizures.

If the management of a paretic be successful, fits will be rare or unknown. If they occur, they may be epileptiform or apoplectiform in type, or resemble a Jacksonian attack in which there is no loss of consciousness. The epileptiform attacks are best treated with an injection of a morphine salt. If the fits continue lumbar puncture sometimes relieves them instantly. Chloroform anæsthesia may be necessary in a severe case. A sedative mixture containing 10 gr. of potassium bromide and 5 gr. of chloral hydrate may be given for a few days after a seizure. A mixture which is useful in preventing seizures contains 15 gr. of hexamine and a similar quantity of acid sodium phosphate. Whatever its action, the regular use of hexamine will produce satisfactory results in limiting the "fits" of paresis. The paralyses following the fits clear up rapidly, often within a few hours. It is probable that antisyphilitic treatment also minimises the risk of fits. Novarsenobillon, and mercury and iodides have some influence, though there are some patients who do not tolerate either very well, and in this case the drugs should then be discontinued.

During the confusion and paralysis following a seizure it may be necessary to feed the patient artificially. Swallowing becomes difficult or temporarily impossible, and attempts at spoon-feeding are dangerous. It is better to use a nasal tube once or twice a day so that food and necessary medicines can be given with safety and certainty. The bowels may prove difficult to move after a fit; an enema should be used, a simple soap solution being all that is required.

Sudden attacks of vomiting of the cerebral type may herald a seizure, or may be a troublesome feature of the disease. The diet should be cut down to liquids, hexamine prescribed, and a brisk purge ordered.

Late Stages.

As the disease progresses wasting becomes pronounced, and there will be increasing feebleness and inability to walk or stand. At this period there will also be a rarefying osteitis of the long bones and ribs, and a fall or other slight injury is very liable to produce a fracture. Friends should be warned of this serious possibility. Pronounced ataxy and feebleness is best dealt with by putting the patient to bed, preferably on a water- or air-bed. Improvement often follows, and in a week or two the patient can be got up again. Wasting becomes pronounced, and great efforts will be needed to prevent bed-sores. Measures must be taken to keep the patient clean and dry. Constant inspections are necessary to see if changing is required. While the patient is still up a large sanitary towel is useful to prevent the soiling of clothes. It may be used when the patient becomes bed-ridden, but care must be exercised to see that the towel is changed at once when wet or dirty. Wet sheets and garments must be removed at once, and when in bed the patient's position should be altered hourly, both by day and night. A night nurse is a necessity in the later stages. A careful toilet of the skin must be carried out twice daily, and prominent points rubbed with spirit and dusted with an antiseptic powder. Should bed-sores appear they may be treated with any mild antiseptic dressing, which must be renewed frequently. A

[1] Part I., on the Recent Case, appeared last week.

sluggish bed-sore will often heal after it has been fomented for a few days. In the final scenes artificial feeding may be required, and is easily performed through a nasal tube.

Antisyphilitic Treatment.

Many patients seem to derive benefit from regular courses of N.A.B. or sulfarsenol, the latter drug being given intramuscularly. A course may be given at intervals of 4–6 months. The dosage should be small to commence with and increase gradually. Commencing with 0·45 g. of N.A.B. or 0·18 g. of sulfarsenol, the dose is increased to 0·9 g. and 0·60 g. respectively at a slow rate, the intervals between the injections being a week, and six or eight injections complete the course. Improvement in general health may result, but the use of these preparations is inadvisable when the patient does not tolerate them well, or if there is no definite physical improvement.

The same remarks apply to mercurial preparations. A mixture containing 5 gr. of potass. iodid. and a drachm of liq. hydrarg. perchlor. t.d.s. may be helpful, and relieves headache, if present. A pill containing ¼ gr. of hydrargyri iodid. virid. is another good prescription, and is given twice daily, with regular rests. Should mercury in some form produce improvement, and be well tolerated, it can be safely continued. If there is no physical benefit, or any sign of intolerance, continued use of the preparations of either arsenic or mercury are not justified.

Conclusion.

The practitioner should not fail to warn the family of a paretic of the risks attached to nursing at home. There may be attacks of excitement, or sudden impulsive actions on the part of the patient which almost invariably indicate legal care to be a necessity. In a small establishment home care is a grave problem, and if the mental condition permits of certification, the patient is just as contented in a mental hospital. The care of property is a question which need present little difficulty. This can be dealt with by procedure under Section 116, Subsection (*d*) of the Lunacy Act, by which the property of the patient can be cared for, provided he be shown to be incapable of managing his own affairs by reason of mental infirmity arising from the disease.

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Special Articles.

THE DEATHS OF MERCHANT SEAMEN IN 1925.

BY FLEET-SURGEON W. E. HOME, M.D.

THE Board of Trade's "Return of Shipping Casualties to and Deaths on Vessels Registered in the United Kingdom" (excluding the Irish Free State) for 1925, the only vital statistic for the merchant marine, was issued in April. It has the same eight pages as before, but costs 2*s.* only, instead of 3*s.*, which is a slight improvement to begin with. The number of seamen concerned is much the same as in the year preceding, being for "first crews of ships," in steam, British, 168,208; foreigners, 11,864; and Lascars, 54,969; total for steam, 235,041; and in sail, 1983, who, as nothing is said to the contrary, may all be taken as British. No hint is given as to the average numbers employed daily, but the figures of previous five-yearly censuses of seamen suggest that the average is generally 90 per cent. of the "first crews"[1]; and we therefore adopt, as the numbers probably employed daily (the figures with which to attempt calculating death-rates), British, 153,131; foreign, 10,678; Lascars, 49,472; and hope they will give us a tolerable approximation. Then we have, per 1000, the following as the likely death-rates:—

—	In sail.	In all.		
		British.	Foreign.	Lascar.
Death-rate for disease ..	2	2·05	4·97	5·33
,, ,, alcohol ..	—	0·22	0·46	—
,, ,, accident ..	12	3·25	3·74	1·74
—	14	5·52	9·17	7·07

Sailing ships (1983 men, 28 deaths) show a lesser death-rate than steamships by disease, but a vastly greater loss (treble) by accidents. They have less and less influence on the total from year to year, as the numbers they employ (in 1905, 25,000; now, 1983) are constantly decreasing. Even with so few in sail British merchant seamen have a risk of death by accident, 3·25 in 1925, nearly three times that (1·13) stated for the coal-miner, underground, on p. 191 of the recent report of the Royal Commission on the Coal Industry. That Commission stated the rate in shipping, 1922–24, as 1·28, but did not give the exact reference; in those years the death-rate from accidents of seamen on their ships was 3·15, 2·78, and 2·60. In 1925, as we have seen, it was 3·25; cases influenced by alcohol are all and always excluded.

Since the last return, which appeared rather more than a year ago, the Board of Trade has taken counsel with experts from the offices of the Registrars-General of England and Wales, and of Scotland, and with other authorities, and has adopted some at least of their advice, so that the list of the diseases which were the causes of the deaths of seamen no longer causes a shock of pained surprise to the doctor who chances to read it, tuberculosis being no longer distinctly separated from the diseases due to infection. Yet the list is not quite what is wanted. There is only room on it for 27 lines of diseases or groups of diseases mentioned. Now we all know that if people were asked to submit the best 27 headings under which to group to best advantage, most instructively, the deaths which from year to year might occur among seamen, no two would submit lists that were identical, yet undoubtedly certain of the more frequently recurring and more important diseases of seamen would be included in all such lists if submitted by doctors who were acquainted with the prevalences of disease and death among seamen. Cholera, dysentery, plague, yellow fever, malaria, beri-beri—diseases to which seamen are by their occupation more exposed than other men—would probably appear in all, and pneumonia, enteric fever, and small-pox also, causes of too frequent deaths and to be prevented. Yet plague, dysentery, yellow fever, and beri-beri are not given lines on the form itself (though they are wisely mentioned in the notes), while valuable lines are surrendered to various diseases of children, rarely attacking seamen, measles, whooping-cough, scarlet fever. Whooping-cough! Just think of it! In 1922 (that book happens to be at hand) there were 2864 male deaths from whooping-cough in England and Wales; most of them occurred under the age of 5 years; only *two* happened among men of the age of seamen (15-60), yet one valuable line in the return is wasted on this disease, which a seamen will only get by an accident (the Navy does not give whooping-cough one of its 100 lines of diseases), while plague, of great importance to the seamen, is crowded out, like beri-beri, from which there were

[1] Proc. Roy. Soc. Med., 1926, xix., Epidemiology, p. 97.

21 deaths. Naturally, there is no doctor's signature expressing approval with this list of diseases, only the same layman's as last year. Very likely he will learn better in time, and he has done better this year.

There were, in 1925, 843 deaths among British seamen from disease, the most important single cause being pneumonia, 49 (46 in the previous year); there were fewer deaths from enteric fever, 12 (29); from malaria, 11 (28); from tuberculosis of the lung, 11 (21); and from other tuberculosis, 3 (12). There were more from alcohol, direct and indirect, 34 (26), and more from accidents, 496 (433); the numbers for the various accidents were: heatstroke, 20 (9); murdered, 8 (4); suicide, 37 (28); lost in accidents to ships, 186 (132); lost in accidents on board, 150 (178); in accidents ashore, 95 (82). Lascars had, as usual, a higher death-rate for disease than had British seamen, but a lower rate for accidents. Their rates were increased for pneumonia, 51 (49) cases; for phthisis, 48 (43); and for beri-beri, 20 (11). Anyone in the profession can see there should be an inquiry about these 20 deaths from beri-beri, with a view to future prevention, but we do not hear of such inquiries. How long will it be before the profession insists there shall be a special medical officer, of the standing of a medical officer of health, appointed to see that the necessary thought is given to the health of merchant seamen?

It appears as if seamen in 1925 had a death-rate from enteric fever four times that of the standard for males of their ages in England and Wales, for small-pox 100 times, for accidents six times, but only half the standard for pneumonia, and a twentieth of that for tuberculosis of the lung. The phthisis-rate is less comparable for seamen than are others, for phthisis is a chronic disease, and the death-rate shown for seamen cannot be complete, as patients cannot go on serving, and so most of them drop out of the ranks of seamen before their deaths are registrable, so the Board of Trade does not hear of them and they are not counted in the return. The death-rates here stated for pneumonia are: for British seamen, 0·32; for Lascars, 1·03; for the Army in 1925 the rate was 0·33; and for the Navy in 1924 (last year available), 0·14.

DEATHS AND DEATH-RATES FOR MERCHANT SEAMEN IN 1925.

Numbers, probable daily average	Number of deaths.			Per 1000.		
	British, 153,131	Foreign, 10,678	Lascar, 49,472	British, 1000	Foreign, 1000	Lascar, 1000
Equivalent of a single death ..	—	—	—	0·00654	0·0936	0·02
Cholera	—	—	3	—	—	0·06
Dysentery	10	—	7	0·06	—	0·14
Enteric fever	12	5	6	0·08	0·47	0·12
Influenza	2	1	3	0·01	0·09	0·06
Malaria	11	—	17	0·07	—	0·34
Plague	—	—	—	—	—	—
Pneumonia	49	6	51	0·32	0·56	1·03
Small-pox	3	—	2	0·02	—	0·04
Tuberculosis (lung)	11	4	48	0·07	0·37	0·97
,, (other)	3	1	3	0·02	0·09	0·06
Yellow fever	1	—	—	0·01	—	—
Other infective diseases	7	—	—	0·04	—	—
Beri-beri	1	—	20	0·01	—	0·40
Cancer	8	1	2	0·05	0·09	0·04
Other general diseases	2	1	—	0·01	0·09	—
Diseases of the—						
Nervous System	18	1	2	0·12	0·09	0·04
Circulatory ,, ...	72	9	20	0·47	0·84	0·40
Respiratory ,, ...	8	2	7	0·05	0·19	0·14
Digestive ,, ...	38	5	8	0·25	0·47	0·16
Urinary ,, ...	8	2	9	0·05	0·05	0·18
Other defined diseases	16	—	—	0·11	—	—
Ill-defined and unknown	33	15	56	0·22	1·40	1·13
Total diseases	313	53	264	2·05	4·97	5·33
Alcoholism	5	1	—	0·03	0·09	—
,, (accidents)	25	4	—	0·16	0·36	—
,, (diseases)	4	—	—	0·03	—	—
Total alcohol	34	5	—	0·22	0·46	—
Heatstroke	20	1	4	0·13	0·09	0·08
Homicide	8	—	5	0·05	—	0·10
Suicide	37	3	18	0·24	0·29	0·36
Casualties to ships	186	10	3	1·22	0·94	0·06
,, on board	150	16	47	0·98	1·50	0·95
,, ashore	95	10	9	0·63	0·94	0·18
Total accidents	496	40	86	3·25	3·74	1·74
Total of all deaths ..	843	98	350	5·513	9·17	7·07

One definite advance is notified this year: most of the deaths are, it is stated, now certified by a doctor, so their classification is more reliable. We are still left without any convincing statement of the average number of men employed daily, and we are without any officially-propounded death-rate, however approximate, for seamen in 1925. In addition, there is no discussion of the deaths that occurred, nor is there any suggestion that the prevention of any of these diseases or deaths is being actually considered; such prudent medical procedures could hardly have been expected from a body which has no permanent professional adviser, and is only intermittently professionally advised.

The Board of Trade seems slow in learning, for although it has during 30 or 40 years, perhaps longer, exercised supervision over seamen's diseases, it still thinks whooping-cough among the 26 more important of them. Was it not judicious of the Royal Sanitary Institute to forward to the Board of Trade and the Ministry of Health a resolution that the care of the health of the men of the Merchant Service should be given in charge to the Ministry of Health, the Board of Trade not being specially organised for that duty?

THE MEDICAL REGISTER: UNTRACEABLE PRACTITIONERS IN 1927.

WE are requested by the Registrar of the General Medical Council to publish the following list of medical practitioners who have not replied to his inquiries as to the accuracy of their addresses. Anyone who finds his or her name included in this list should communicate immediately with the Registrar of the General Medical Council, 44, Hallam-street, Portland-place, London, W. 1, otherwise the name will be omitted from the next issue of the Medical Register.

Abdurahman, Ismail, M.B., 1915(E).
Abushady, Ahmed Z., L.M.S.S.A., 1915(E)
Adams, Edward J., M.R.C.S., 1867(E).
Addinsell, John H., L.R.C.P., 1901(E).
Addison, Hallowes L., M.R.C.S., 1914(E).
Adeney, George C., M.R.C.S., 1903(E).
Ahearne, Joseph, L.R.C.S., 1871(E).
Ahmad, Abdul M., M.R.C.S., 1916(E).
Ahmed, Esawy, M.R.C.S., 1917(E).
Aiken, James P., M.B., 1912(I).
Ainley, Frederick S., M.B., 1893(S).
Ainsley, James E., L.R.C.P., 1916(E).
Ainsworth, Douglas R., M.R.C.S., 1922(E).
Alcorn, Robert M., L.R.C.P., 1914(I).
Alexander, Frederick H., M.B., 1921(E).
Allen, Norman, M.R.C.S., 1886(E).
Allman (Mrs.), Ethel A., M.B., 1909(E).
Allport, Evett G., M.R.C.S., 1902(E).
Alper, Minnie, M.B., 1922(E).
Anderson, Charles M., M.R.C.S., 1876(E).
Anderson, Florence M., M.B., 1922(I).
Anderson, Frederick, M.B., 1897(S).
Anderson, John C., M.B., 1897(E).
Anderson, Thomas Cochrane, M.B., 1882(S).
Andrew, George, M.R.C.S., 1874(E).
Andrew, Philip O., O.B.E., M.R.C.S., 1896(E).
Anthony, Christie M., M.R.C.S., 1915(E).
Arbuckle, Donald, M.B., 1911(S).
Areskoug (Mrs.), Carolina, L.S.A., 1904(E).
Armstrong, Harry, L.R.C.P., 1903(S).
Armstrong, Margaret M., M.B., 1924(I).
Armstrong, William L., M.B., 1898(I).
Arnold, Frank A., L.S.A., 1892(E).
Ash, Alfred E., M.R.C.S., 1890(E).
Ashburner, Robert, L.R.C.P., 1883(E).
Atkins, Francis T., L.S.A., 1873(E).
Austin (Mrs.), Cristina, M.B., 1905(S).
Avarne, Claude H. B., M.R.C.S., 1914(E).

Bailey, Edwin R., M.R.C.S., 1914(E).
Bainbridge, Philip G., L.R.C.P., 1923(S).
Baker, Leonard T., M.B., 1909(E).
Banerjee, Prabodh C., L.R.C.P., 1919(E).
Barff, George P., L.R.C.P., 1899(E).
Barker, John E., L.R.C.S., 1863(I).
Barrett, Joseph H. P. B., M.B., 1907(I).
Barry, David T., M.B., 1894(I).
Barry, John M., L.R.C.P., 1901(I).
Barry, Stephen J., L.R.C.P., 1910(I).
Bartlett, George B., M.R.C.S., 1906(E).
Basil-Khan, Minas M., M.B., 1883(S).
Basu, Sir Kailas C., Kt., C.I.E., O.B.E., L.M.S., 1895(Col).
Bates, Herbert, M.B., 1901(E).
Baylor, Robert J., L.K.Q.C.P., 1880(I).
Bayumi, Mahmud, M.R.C.S., 1915(E).
Beale, Thomas M., M.R.C.S., 1899(E).
Bearblock, Arthur, M.R.C.S., 1920(E).
Beards, Samuel A., M.R.C.S., 1924(E).
Beasley, Henry C., L.R.C.P., 1893(I).
Beattie, William P., M.B., 1904(S).
Beddoes, Thomas P., M.R.C.S., 1884(E).
Bell, Francis G., *M.C.*, M.B., 1910(S).
Bell, Mary C., M.B., 1903(E).
Bell-Smyly (Mrs.), Eileen M., M.B., 1917(I).
Belton, Cassius W., L.R.C.P., 1882(S).
Benbow, Thomas A. P., M.R.C.S., 1916(E).
Bennett, Thomas A., L.R.C.P., 1922(I).
Benson, Henry P. D'A., M.B., 1892(E).
Bestawros, Riad H., M.R.C.S., 1925(E).
Betteridge (Mrs.), F. M. C., L.M.S.S.A., 1908(E).
Bevan-Brown, Frederic V., M.R.C.S., 1913(E).
Bhatia, Sohan L., *M.C.*, M.R.C.S., 1916(E)
Bibby, William A., L.M.S.S.A., 1917(E).
Billimoria, Sorab D., L.M.S., 1921(Col).
Birmingham, Herbert J., L.R.C.S., 1881(I)
Bishop, Darell W., M.R.C.S., 1900(E).
Blanchard, David F., L.R.C.P., 1894(S).
Bliedon, Max, M.R.C.S., 1897(E).
Blood, Charles H., M.B., 1884(I).
Bluemel, Charles S., M.R.C.S., 1917(E).
Boltman, Robert F., M.B., 1918(S).
Bonar, Thomas L., M.R.C.S., 1920(E).
Boon, Alfred H., M.R.C.S., 1917(E).
Boughton, William B., L.R.C.S., 1877(E).
Bourns, Newcome W., M.R.C.S., 1879(E).
Bowe, Francis, M.R.C.S., 1880(E).
Bowen, Daniel R., L.R.C.P., 1887(S).
Bowen, John E., M.B., 1921(I).
Bowie, Edgar O., L.A.H., 1914(I).
Bowker, Richard R. P. S., L.S.A., 1900(E).
Boyd, Alexander J., M.B., 1885(I).
Brabyn, George W., L.R.C.P., 1893(E).
Brandt, Reginald R. J., M.B., 1924(I).
Bratton, William, L.R.C.P., 1895(I).
Bray, Frederick H., M.B., 1915(E).
Bray, Percy D., L.S.A., 1885(E).
Breton, Lancelot M., L.S.A., 1895(E).
Briggs, William P., L.F.P.S., 1877(E).
Brigstocke, Leslie C. W., L.S.A., 1907(E).
Brill, Hirsh, M.B., 1917(I).
Bristow, Harry L., M.B., 1906(I).
Brito-Mutunayagam, Michael A. B., M.R.C.S., 1924(E).
Broad, William, M.B., 1899(S).
Brock, Benjamin G., L.R.C.P., 1884(S).
Brodie, John, M.R.C.S., 1919(E).
Brook, Charles, M.R.C.S., 1861(E).
Brook, Thomas, M.B., 1912(I).
Brooks, Gertrude, M.B., 1911(E).
Brooks, (Mrs.) Moira M. St. J., M.B., 1920(I).
Brown, Abraham S. S., M.R.C.S., 1925(E).
Brown, Duncan F., M.B., 1893(S).
Brown, Elijah, M.R.C.S., 1893(E).
Brown, James F., L.S.A., 1897(E).
Brown, John, M.D., 1863(E).
Browne, Elliott S., L.R.C.S., 1874(I).
Browne, William H., L.R.C.P., 1921(I).
Browning, Edgar, M.R.C.S., 1887(E).
Bruce, Hugh G., M.B., 1912(S).
Bruce, James W. K., M.B., 1914(S).
Bryan, Richard B. (Clerk), M.B., 1907 (I).
Burke, Hubert W., L.R.C.P., 1883(E).
Burke-Gaffney, Henry O'D., M.B., 1924(I)
Burman, Hugh W., M.R.C.S., 1905(E).
Burns, Michael J., M.B., 1916(I).
Burrell, Rex J. W., M.B., 1925(I).
Burton, Russell N., L.R.C.P., 1917(E).
Burton, William E., L.R.C.P., 1861(I).
Butterfield, Arthur, L.M.S.S.A., 1915(E).
Bynoe, Charles A., L.R.C.S., 1889(E).
Byrne, Henry, L.R.C.S., 1887(I).
Byrne, Lucretia H. H., L.R.C.P., 1921(I).

Callanan, Michael, L.R.C.S., 1875(I).
Calvo, Ricardo, M.R.C.S., 1918(E).
Cambie, Edward L., L.R.C.P., 1892(I).
Cameron, Patrick S. G., M.B., 1918(S).
Campbell, Helen Y., L.R.C.P., 1907(S).
Capener (Mrs.), Marion C. V. (formerly Clarke), M.R.C.S., 1921(E).
Carew, Walter G., L.R.C.P., 1921(E).
Carleton, Mayberry H., L.R.C.P., 1921(S).
Carrasco, Milton, M.R.C.S., 1915(E).
Carrington, George H., L.S.A., 1884(E).
Carson, James C., M.B., 1922(I).
Carte, Percy G., L.R.C.S., 1895(I).
Carter, Gerald B., M.B., 1896(I).
Carter, Ralph H., M.R.C.S., 1923(E).
Carter, Thomas, L.R.C.P., 1864(E).
Castle, Harold D. B., L.S.A., 1894(E).
Chadwick, Alfred, M.R.C.S., 1875(E).
Chadwick, Charles M., M.R.C.S., 1882(E).
Challenger, Neville E., L.M.S.S.A., 1925(E).
Chapple, Robert Ll., L.S.A., 1893(E).
Chataway (Mrs.), G. S. M., M.R.C.S. 1925(E).
Chaudhri, Kewal R., L.M.S.S.A., 1924 (E).
Childs, Tom W. J., M.B., 1913(S).
Christal, John, L.R.C.S., 1876(I).
Christie, Joseph W., L.R.C.P., 1879(E).
Chu, Ando H., M.B., 1916(S).
Chun, John W. H., M.R.C.S., 1920(E).
Churchill, Alix J., M.R.C.S., 1919(E).
Cieh, Ying-Jue, M.R.C.S., 1915(E).
Clarke, Arthur H., M.R.C.S., 1894(E).
Clarke, Herbert E., L.R.C.P., 1912(I).
Clarke, Joseph H., M.R.C.S., 1872(E).
Clarke, Robert H., M.R.C.S., 1877(E).
Clarke, William F., M.R.C.S., 1887(E).
Clayton, Joseph E., M.R.C.S., 1875(E).
Clein, David, L.R.C.P., 1921(I).
Cline, Eric C., M.R.C.S., 1915(E).
Clough, Harry, L.S.A., 1899(E).
Coetzee, Johannes C., M.B., 1920(I).
Coetzee, Louis J., M.B., 1922(I).
Cohen, Algernon A., M.B., 1880(E).
Cohney, Solomon, L.M.S.S.A., 1922(E).
Colahan, William E., L.R.C.P., 1920(I).
Cole, Arthur, L.R.C.S., 1883(I).
Coleman, Philip, M.B., 1925(I).
Coll, Charles J., M.B., 1922(I).
Collier, Joseph H., L.R.C.P., 1894(S).
Collins, John C., L.A.H., 1926(I).
Comty, Louis N. R., M.R.C.S., 1925(E).
Connolly, James J., M.B., 1922(I).
Connolly, Peter J., M.B., 1922(I).
Conroy, Martin P., M.B., 1923(I).
Cooney, Thomas, L.R.C.P., 1921(I).
Cooper, Hugh A., M.B., 1924(E).
Cooper, William, M.B., 1881(S).
Corbett, Michael, L.R.C.P., 1872(I).
Cordingly, Grace M., L.M.S.S.A., 1913(E).
Corsellis, Ernest, L.R.C.P., 1896(I).
Coulter, Henry H., M.B., 1920(I).
Cowell, George, M.R.C.S., 1859(E).
Cramer, Stanley L., L.R.C.P., 1925(S).
Crean, Charles E., L.R.C.S., 1868(I).
Cremin, John, L.R.C.S., 1871(I).
Crichton, George, L.R.C.S., 1875(E).
Crinsoz de Cottens, François, M.R.C.S., 1916(E).
Crinsoz de Cottens, Marguerite, L.M.S.S.A., 1919(E).
Cronin, Dennis, M.B., 1922(I).
Crooks, David McK., M.B., 1903(S).
Crowe, John J., L.A.H., 1919(I).
Crowe, Matthew S., M.B., 1921(I).
Crowe, Patrick V. F., L.R.C.P., 1912(I).
Cruickshank, William E., L.R.C.P., 1913(E).
Cullen, James A. P., M.R.C.S., 1899(E).
Cullenan, John, M.B., 1916(I).
Cummings, Edwin T., L.R.C.P., 1887(I).
Currie, Oswald J., M.R.C.S., 1881(E).
Currie, William, M.B., 1890(S).
Curtis, Wilfred, L.R.C.P., 1895(S).
Cusack, Bernard A., M.B., 1915(I).
Cusack, Patrick J., L.R.C.P., 1907(I).

D'Abreu, Delphine G., M.R.C.S., 1915(E).
Dallaway, Joseph W. D., M.R.C.S., 1879(E).
Daly, James T., M.R.C.S., 1909(E).
Daniel, Agnes S., M.R.C.S., 1924(E).
Darwent, Claude Trevor, L.R.C.P., 1915(S).
Das, Ishwar, L.R.C.P., 1910(S).
Davidson, Richard, M.B., 1886(S.)
Davidson, Thomas J., M.B., 1922(S).
Davie, Peter C., M.B., 1915(S).
Davies, David E. S., L.M.S.S.A., 1912(E).
Davies, John, L.R.C.P., 1898(S.)
Davis, Norman, M.B., 1888(E).
Day, James D., M.B., 1879(I).
Day-Lewis, Alfred K., M.R.C.S., 1921(E).
Deale, James E., M.B., 1923(I).
Dear, Alexander A., M.R.C.S., 1911(E).
De Forest, Carl B., L.M.S.S.A., 1916(E).
Deif, Ahmed M., M.R.C.S., 1922(E).
de Kock, Jan J. G., M.B., 1919(I).
Delahunt, William P., L.R.C.S., 1884(I).
Delany, James J., M.B., 1915(I).
de la Pasture, Yolande M., M.B., 1925(E).
del Pino, George, M.B., 1915(S).
Denny, Charles J., M.R.C.S., 1865(E).
De Penning, Herbert C., L.M.S.S.A., 1921(E).
Desai, Narayan K., L.R.C.P., 1906(I).
de Sousa, Alberto, M.R.C.S., 1926(E).
de Villiers, Johannes P., M.B., 1920(I).
Devlin, John J. M., M.B., 1924(I).
Devonald, Alfred E. L., L.M.S.S.A., 1911(E).
Dewhirst, Wilfrid A., M.B., 1898(E).
Dick, William, L.R.C.P., 1904(S).
Dillon, Henry V. M., L.R.C.S., 1882(I).
Dimond, John L., M.B., 1900(E).
Dippenaar, Michiel C., M.B., 1917(I).
Dixon, Charles W., M.B., 1914(E).
Donald, James K., M.B., 1924(S).
Donelan, Joseph O'C., L.R.C.S., 1887(E).
Dooley, Annie, M.B., 1916(I).
Doran, Ambrose, L.R.C.P., 1921(I).
Dorner, Georg, M.R.C.S., 1911(E).
Douglas, John, M.B., 1924(S).
Douglas, William, M.R.C.S., 1868(E).
Doyle, Andrew A., L.R.C.S., 1887(I).
Doyle, Dominick J., M.B., 1917(I).
Drake, Dennis C., M.R.C.S., 1925(E).
Drew, Hedley V., M.R.C.S., 1882(E).
Drysdale, John H., M.R.C.S., 1889(E).
Duckworth, Herbert C., L.A.H., 1922(I).
Duffus, James, M.B., 1881(S).
Duigenan, John J., L.R.C.S., 1877(I).
Dunn, John H., M.B., 1920(I).
Dunne, John, M.B., 1922(I).
Dustan, Henry, M.R.C.S., 1874(E).
Dwan, John H., L.R.C.P., 1889(I).
Dwyer, John, L.R.C.P., 1915(I).
Dwyer, Joseph B., L.R.C.P., 1917(I).

Eager, Mervyn, M.R.C.S., 1903(E)
Eames, Edward Thomas P., M.R.C.S., 1892(E).
Eddowes, William, M.R.C.S., 1861(E).

Edwards, Frank P., M.R.C.S., 1900(E).
El Aguizy, Aly M., M.B., 1920(E).
Eliason, Joseph E., M.B., 1923(I).
Elliott, Harry S., M.R.C.S., 1892(E).
El-Makkawi, Mohammed M., L.R.C.P., 1925(E).
Engelbach, Harold A., M.B., 1895(I).
English, Geoffrey D., M.B., 1922(E).
Evans, John, L.A.H., 1874(I).

Fabien, Lewis, M.R.C.S., 1910(E).
Fahmy, Nashed, M.R.C.S., 1915(E).
Fairbridge, Francis S., L.R.C.P., 1889(S).
Farquharson, Charles H., L.R.C.P., 1900(E).
Farris, Sadik, M.B., 1921(E).
Faruqi, Shaikh M. A., M.B., 1917(E).
Fearnley, William, L.R.C.S., 1875(S).
Fehrsen, Frederick O., M.R.C.S., 1916(E).
Feilden, Frederick E., L.S.A., 1900(E).
Ferguson, Mary M. G., M.B., 1916(S).
Ferran, Theresa A., M.B., 1921(I).
Fielder, Sidney, L.S.A., 1889(E).
Fink, Lawrence G., M.B., 1892(S).
Fisher, Francis C., L.K.Q.C.P., 1877(I).
Fisher, John B., L.A.H., 1876(I).
Fitzgerald, Daniel A., M.B., 1919(I).
Fitzgerald, John C., L.R.C.P., 1924(I).
Fitzgibbon, Maurice, M.B., 1904(I).
Fitzpatrick, Patrick, M.B., 1918(I).
Flecker, Hugo, M.B., 1912(Col).
Fletcher, John H., M.R.C.S., 1893(E).
Flynn, Ernest J. M., L.R.C.P., 1884(I).
Flynn, John, M.B., 1887(I).
Foley, William F., M.B., 1922(I).
Fox, Herbert, M.B., 1897(E).
Fox, Norman M. D., L.R.C.P., 1921(S).
Fox, Otho P., L.R.C.P., 1921(S).
Frazer (Mrs.), Jane M., M.B., 1912(S).
Frederick, Ernest V., M.R.C.S., 1916(E).
Freedman, Tobias, M.B., 1923(I).
Freeman, Denis W., M.B., 1883(I).
Freeman, Jack, M.B., 1923(E).
Frood, Thomas M., L.R.C.S., 1887(I).
Frossard, Philip E. F., M.R.C.S., 1917(E).
Fulton, James, M.B., 1890(I).

Gabbe, Siegfried D., M.B., 1923(I).
Gabites, Frederick C. M., L.M.S.S.A., 1919(E).
Galbraith, James B. D., M.B., 1917(S).
Galvin, John S., M.B., 1916(S).
Garahy, John, M.B., 1923(I).
Gasperine, John J., M.R.C.S., 1916(E).
Gay, Charles W. E., M.R.C.S., 1877(E).
Gibbes, John M., M.R.C.S., 1866(E).
Gibson, Arthur K., M.B., 1916(S).
Gilford, Dorothy, M.R.C.S., 1917(E).
Gill, Gurdial S., M.B., 1919(S).
Gillespie, Mary B., M.B., 1918(S).
Girgis, Eskander, M.B., 1923(E).
Glanville, Mark, M.R.C.S., 1887(E).
Glissam, Francis R. D'A., M.B., 1904(E).
Godfrey, Benjamin G., M.R.C.S., 1875(E).
Goldberg, Joseph, M.R.C.S., 1925(E).
Goldsmith, Henry, L.R.C.P., 1925(E).
Goodchild, Thomas A., L.R.C.P., 1889(I).
Gordon, John, M.B., 1872(S).
Gornall, Thomas B., M.B., 1899(S).
Gould, Charles H., M.R.C.S., 1913(E).
Gould, John E., M.R.C.S., 1888(E).
Goulston, Arthur, M.R.C.S., 1888(E).
Grace, Jeremiah, L.R.C.P., 1906(I).
Gracey, Daniel L., M.B., 1921(I).
Graham, Alfred S., M.B., 1920(E).
Graham, George R. M., L.K.Q.C.P., 1884(E).
Graham, Gilbert M., M.B., 1911(S).
Graham, William M., M.B., 1893(I).
Graham-Hodgson, Harold K., M.B., 1916(E).
Grant, David R., M.R.C.S., 1925(E).
Grant, Edward A., M.B., 1922(I).
Gray, James J., L.R.C.P., 1894(S).
Green, Cyril A. H., M.R.C.S., 1924(E).
Greenwood, Cecil D., L.S.A., 1883(E).
Griffen, Vincent D., L.R.C.P., 1910(S).
Griffith, James De B., M.B., 1874(I).
Grimmett, Roger S., M.C.P. & S., 1924(Col).
Grobler, Paul J., M.B., 1923(I).
Grove, Frederick P., M.R.C.S., 1901(E).
Groves, Ernest J. C., M.B., 1905(S).
Guilfoyle, Denis P., M.R.C.S., 1918(E).
Guinness, Gershom W., M.B., 1896(E).
Gunewardene, Hubert O., M.R.C.S., 1919(E).
Gwynn, Neville C., M.R.C.S., 1897(E).

Harling, Harry S., L.R.C.P., 1909(S).
Ho Asjoe, Salomon, L.R.C.P., 1922(S).
Homer, Charles, L.R.C.P., 1908(S).
Hooper, Henry S. C., M.R.C.S., 1914(E).
Hulme, John W., M.R.C.S., 1922(E).

John, John R., M.R.C.S., 1917(E).
Johnston, Henry S., L.R.C.P., 1908(I).
Jones, Ralph, L.M.S.S.A., 1913(E).
Jones, William A., L.M.S.S.A., 1922(E).

Kelly, Daniel, *M.C.*, L.R.C.P., 1915(I).
Kelly, Ignatius P., M.B., 1911(I).
Kerans, Robert, L.R.C.S., 1864(I).
Kumar, Gautam, M.B., 1922(Col).
Lambert, Alexander C., *M.C.*, M.C.P. & S., 1916(Col).
Lauder, Harold V. R. T., M.R.C.S., 1923(E).

MacCarthy, Charles T., M.B., 1923(I).
McCorkell, Andrew E., M.B., 1922(I).
McCormack, Michael J., L.A.H., 1914(I).
Macpherson, James S., C.M.G., L.R.C.P., 1886(S).
Magill, Robert, L.R.C.S., 1872(I).
Maguire, Joseph, L.R.C.S., 1887(I).
Matthews, Vivian M., M.R.C.S., 1922(E).
Mifsud, Alfred E., L.R.C.P., 1886(E).
Mill, William, M.R.C.S., 1882(E).
Moorshead, Charles W., L.S.A., 1896(E).
Morrison, David, M.B., 1894(E).
Mullane, Patrick, M.D., 1880(I).

Nicolas, John D., L.R.C.P., 1904(S).

Ogilvie, Nettie, L.R.C.P., 1889(S).
O'Grady, Francis R., L.R.C.S., 1868(I).
Oliver, Stuart, L.S.A., 1885(E).

Paling, John M. A., M.B., 1922(Col).
Perkins, Herbert F., M.B., 1902(I).

Quirk, Edward J. J., M.B.E., M.R.C.S., 1908(E).

Ralston, Frederick G., M.B., 1899(S).
Reid, Oswald J., M.B., 1920(Col).
Richards, Arthur J., L.R.C.P., 1893(S).
Rom, Solomon J., L.R.C.P., 1922(S).
Ross, Donald M., L.R.C.P., 1903(E).

Samut, Carmel, M.D., 1915(Col).
Sheridan, John J., M.B., 1921(I).
Sisk, Maurice, M.B., 1895(I).
Smartt, The Hon. Sir Thomas W., K.C.M.G., L.R.C.S., 1878(I).
Stokes, William, M.D., 1878(I).
Sumner, Theodotus J., M.B., 1923(S).

Taaffe, Robert H. F., L.R.C.P., 1910(I).

Van Ryck de Groot, Stanley, H. R., L.S.A., 1892(E).
Vellema, Douwe M., M.B., 1923(I).

Wheat, Ernest G., M.R.C.S., 1908(E).
Whyte, Henderson, M.R.C.S., 1915(E).
Wilkin, Richard McK., L.R.C.P., 1900(I).
Winship, William A., L.S.A., 1885(E).
Woods, Thomas F. M., M.B., 1926(I).

THE TREATMENT OF RHEUMATISM IN GERMANY.

A VISIT TO SPAS AND CLINICS.

A PARTY of 20 Englishmen has recently been to Germany to study the methods of treating rheumatic patients, and the organisation for insured patients, in the German cities and spas. The party included representatives of a committee of the British Red Cross Society, the International Society of Medical Hydrology, and several of the English Approved Societies.

In Hamburg, Berlin, and Dresden, it was found that the so-called "rheumatic diseases" formed the great majority of those under treatment by physical remedies. Some of the best known clinics, such as Prof. E. O. Plate's at Hamburg and Dr. August Laqueur's at Berlin, are special departments of general hospitals. They include (1) a complete hydrological installation, with various methods of treatment by friction baths and douches, steam and hot air; and (2) apparatus for light baths and electrical and mechanical treatment. There are, however, in these and other cities a number of other institutions, some of them very large, established by the public insurance organisations (sick-clubs), in which physical treatment is the main feature. To these institutions all kinds of minor cases, both surgical and medical, are referred by insurance practitioners for treatment, and advice is given in many specialised subjects. At some of these "ambulatoriums," to which no beds are attached, 800 cases or more are treated daily.

The visit to Berlin was timed to enable the party to take part in the inaugural meeting of a German committee that has been formed to promote research upon, and treatment of, rheumatic diseases. This was held on August 2nd at the clinic of Prof. A. Bier, under the chairmanship of Prof. Dietrich (Berlin). Among those present were Prof. Bier, Prof. Hoffman, Prof. Kuttner, Dr. Zimmer, and Dr. G. Hauffe (Berlin), Dr. W. Krebs (Aachen), Dr. J. van Breeman (Amsterdam), and Dr. Fortescue Fox, Dr. D. A. Coles, Dr. M. B. Ray, Dr. Hector Munro, Dr. C. E. Sundell, Dr. W. S. C. Copeman, Dr. Maurice Shaw, and Dr. M. Mautner (London), besides representatives of the Railways, Coöperative, Building, and other English approved societies. A paper on the facilities at present available in Germany for the physical treatment of insured persons was read by Dr. Max Hirsch (Berlin). The new German organisation will form a branch of a central committee on rheumatism established by the International Society of Medical Hydrology.

After this conference the medical representatives from England and Holland visited a number of spas which are chiefly concerned in the treatment of rheumatism. Their object was to observe: (1) the methods of treatment actually in use; (2) the various arrangements made for industrial patients, both men and women, at the health resorts, and (3) the existing facilities for medical research in rheumatic diseases. Considering the large numbers of incipient and chronic cases of all forms of rheumatism gathered together at the spas and the city clinics, they also had in mind the possibility of instituting further systematic research to be carried out concurrently with treatment. To assist in their investigations the relevant facts and figures were freely placed at their disposal in the course of many conferences with governmental and municipal spa authorities, officers of industrial societies, and spa practitioners. They found that in regard to special research good work had already been done, whilst

more was in contemplation. A well-equipped institute of balneology, supported by the municipality, has been opened in the present year at Wiesbaden under the direction of Dr. Harpreder, and research laboratories are being added to the Landesbad at Aachen.

In Germany the problem of rheumatism arouses deep and widespread interest. Not only are the many industrial organisations, the public health authorities, and the spa practitioners concerned with it, but also the medical profession as a whole, and the spa federations and municipalities. The problem itself is in many ways the same as in England, and the information gathered in Germany is likely to be of considerable value in this country.

PUBLIC HEALTH IN 1926.

SIR GEORGE NEWMAN'S REPORT.[1]

THE annual report of the Chief Medical Adviser to the Minister of Health must of necessity, as Sir George Newman remarks in his summary, consist of a body of extremely varied, in fact almost miscellaneous, information and opinion. "The progress of a nation's health," he observes, "is . . . a passage through the centuries, and founded mainly on an exclusive regard to the immediate interests and problems of human survival. We are dealing with the proposition of remaining alive in the world, of enlarging the content of life, of increasing its capacity. . . . Can any enterprise be greater? . . . There is hardly a department of the State which will not, consciously or unconsciously, make a contribution to the condition of the public health."

Sir George Newman stresses as the very foundation of the nation's welfare the sanitary duties laid upon local authorities, and enumerates the seven services in which the science and art of preventive medicine have expressed themselves during the last generation. These are: Ascertainment of the situation (notification, &c.); maternity and child welfare; school medical services; national health insurance; Poor-law medical services; Factory Acts; and a series of special means for direct attack upon some of the more insidious and incapacitating maladies, such as small-pox, tuberculosis, venereal disease, and mental decay. He affirms his belief that these seven activities have changed the face of England and, moreover, for all their limitations and imperfections, they have been copied all over the world. "In spite of an enormous increase of population," he says, "without increase of home territory, the total death-rate and infant mortality-rate of the nation have been halved inside four generations. The mortality of childhood is one-third of what it was 80 years ago, and the expectation of life to-day is 17 years longer than in 1876. . . . Never before in the history of this country has so much been attempted by the State on behalf of the health of the people as now. . . . We have in England to-day such opportunity as we have never had before to conquer preventable disease and to ensure personal health and increased capacity." Sir George Newman speaks warmly of the value of health propaganda, even though it is often unbalanced and ill-informed; he cites as its chief fault a lack of sense of proportion, a criticism which we have had to make with some frequency in these columns.

Vital Statistics.

The report commences with a review of the vital statistics, and summarises the report of the 1921 census, recently issued. The indirect results of the war on belligerent populations were as serious as the direct effects. For instance, the proportion of males aged 20–40 fell between 1911 and 1921 from 155 to 141 per 1000. The birth-rate for 1926 was 17·8, the lowest on record, but this country is nearer the neutrals than Germany owing to its favourable infant mortality-rate, reduced last year to 70 per 1000, and thus representing a saving of 40,000 lives above the average. The daily ebb and flow of workers in and out of the metropolis has an important bearing on the spread of infectious diseases. The death-rate in 1926 was 11·6 per 1000, representing 19,037 fewer deaths than in 1925. Increase in the mortality from diphtheria, cancer, and diseases of the heart was more than counterbalanced by the decline in deaths from influenza, pneumonia, bronchitis, and the diseases of infancy. The death-rate in the first four weeks of life and among illegitimate babies still calls for improvement. All classes suffered badly from whooping-cough, and the incidence of diphtheria, poliomyelitis, and small-pox showed an increase. In England and Wales during 1926, among insured persons alone, a total of 28¼ million weeks' work (the equivalent of 12 months work of over 540,000 people) was lost through sickness. The labour and expense entailed in the care of these people, and the fact that they were breadwinners for others, must be remembered in assessing the loss to the nation.

Accuracy of Statements of Causes of Death.

In discussing death certification the report maintains that official records of mortality suffer from serious and remediable defects, falling under two headings:—

(1) Relevant information throwing light upon the real cause of death is available but not presented; thus, deaths from motor accidents have almost doubled in six years, although the ratio may not have increased; but there is no analysis of the mishaps, and we do not know how many of the 3308 victims were drivers, passengers, or pedestrians respectively. Here is an example where exact information is available, but is not disclosed. Dr. Stevenson's investigation reveals that it is the three- or four-wheeled vehicle which kills small children; the well-braked tram is safer than the car, and the mobile motor cycle is more dangerous to its rider than to the pedestrian. A decline in mortality should therefore accompany improvement in brakes.

(2) Information is not available and ignorance may be disguised by verbalism. Many of the deaths ascribed every year to cancer of the liver and gall-bladder must in reality be due to primary growths in other organs, and any attempt to measure the effect of means of treatment are seriously prejudiced by this laxity in certification. There is no doubt, the report holds, that our knowledge of the real toll of human life taken by alcoholism would be appreciably extended by a confidential death certificate.

Discussing *status lymphaticus*, the report asks pertinently what means practitioners have of knowing if the thymus of a person who has died suddenly is or is not enlarged. Prof. J. A. Hammar's recent monograph reveals an enormous range of weight within strictly normal material. Status lymphaticus, to quote Prof. M. von Pfaundler, has been denatured into a "pandiathesis." To diagnose it on thymus weight alone is unscientific. This is not to say that there does not exist a human type prone to die suddenly without adequate cause; the type was recognised hundreds of years ago, but the attempt to provide precise anatomical criteria has failed. The term "status lymphaticus" on a death certificate is characterised as an example of the misuse of the jargon of endocrinology, nutritional chemistry, or psycho-analysis to explain the origin of symptoms and signs. Sir George Newman considers that it is hardly too much to say that the fabric of the art and practice of preventive medicine is founded upon the accuracy of the registration of the cause of death. Unless and until a nation has adopted a sound system of vital statistics—the book-keeping of humanity—there can be no evaluation of assets and liabilities.

Epidemiology.

In 1926 10,146 cases of *small-pox* were notified, the most striking feature being the very large number of cases[2] in the county of Durham. The report states

[1] H.M. Stationery Office. Pp. 281. 3s.

[2] See THE LANCET, 1926, ii., 1175; 1927, i., 39; 1927, i., 238.

clearly that the time has come for the public to choose between small-pox and vaccination, and to realise the difficulties attending the control of the present mild outbreak. Small-pox, severe or mild, is a menace which should be prevented; our duty is to rid the country of it, and successful vaccination and re-vaccination constitute an efficient protection.

There were 2739 cases of enteric, a decrease of 40 on 1925, two cases of bubonic plague, one of typhus, no cholera, but an increase in dysentery.

A report has now been issued giving exhaustive analysis of the information yielded by the inquiry into *scarlet fever*. The Committee concluded that there are not sufficient grounds for prescribing a routine period of detention in hospital of more than four weeks for uncomplicated cases; that hospital and home treatment must play a fundamental part in a well-ordered public health system; that some of the accommodation reserved for scarlet fever might be better used for pneumonia, measles, or influenza; and that current rather than terminal disinfection is the more rational procedure. The report speaks very hopefully of the prospects of the Dick as well as of the Schick processes.

There were 51,069 cases of *diphtheria* during the year, with 2994 deaths, a serious burden of disease and mortality. Local authorities are advised to aim primarily at offering protection to the pre-school population through infant welfare or special clinics; it is essential for the organisation to be prepared beforehand, the staff trained and public opinion enlightened. The vast majority of parents are still completely ignorant of the possibility of protection. The large increase in mistaken diagnoses in London can be taken fairly to suggest that greater care is being taken in notifying suspicious cases.

A slight, mild epidemic of *influenza* broke out in London early in 1926 and spread slowly northwards. The death-rate was low, mainly due to bronchial pneumonia. Convalescence was rapid, but often accompanied by persistent cough. Among the researches carried out under the Auxiliary Scientific Investigation Fund was the prosecution of a study of the respiratory flora of apparently normal persons, in the hope of elucidating some of the problems of epidemic influenza. There was no increase in the pneumococcus during the late autumn of 1925, although there was some increase in Pfeiffer's bacillus. In 1926 the situation completely changed; the pneumococcus rose from under 10 per cent. to 60 per cent. between October and November, and remained up till the end of January. Pfeiffer's bacillus also increased, less notably, but in January suddenly became very prevalent. It thus appears that a sudden increase in the frequency of healthy carriers of pneumococci precedes an epidemic manifestation of influenza.

Infections of the Nervous System.

While the reported prevalence of cerebro-spinal fever and encephalitis lethargica was less than that of 1925, there was a very striking increase in poliomyelitis and polio-encephalitis, the notification figures exceeding all previous records. The report does not think it safe to assume that this presages a continued decline in the incidence of encephalitis lethargica, and finds even less reason to ascribe the improvement to any human intervention. An inquiry into the nature and amount of resulting disability has been held, and will, it is hoped, provide a reliable guide to the best after-treatment. The encephalitis unit at Winchmore Hill seems likely to prove most useful as a clearing house for observation, classification, and allocation. The work of departmental officers on the subject is summarised.

A special chapter is devoted to acute poliomyelitis on account of its excessive prevalence during the year. The history of the disease and of the 1926 outbreaks is reviewed. The conclusion arrived at is that Wickman's original findings in favour of contact transmission have been amply confirmed. Sufferers from an acute, mild, or atypical form, healthy persons who have been in contact, and chronic carriers who have apparently quite recovered, may all convey the infection. There is no satisfactory proof of natural transmission by biting insects or by milk. It must be remembered that the incubation period varies within wide limits, and that many cases are never notified. Three out of the five outbreaks occurred in districts accessible by sea or river, and infection may have been conveyed to Kent from Brittany. The term "infantile paralysis" is condemned as a misnomer and the disease defined as "an acute infectious fever which may or may not proceed to invasion of the nervous system." The pathology, symptoms, diagnosis, and treatment are reviewed and commendation given to Walshe's three-stage classification—i.e., (1) general infection, (2) subarachnoid invasion, (3) involvement of the grey matter. The essential of treatment is said to be coöperation between medical officer of health and local practitioners, and improvement in notification is urged. A review of treatment measures indicates that, if paralysis occurs, permanent crippling can only be avoided by prompt and long-continued orthopædic treatment, which should be secured as part of the scheme for maternity and child welfare.

Cancer and Tuberculosis.

The mortality-rate per million was 961 for tuberculosis and 1362 for cancer. The work of the departmental committee during the year included investigations into the statistics and radiological treatment of cancer of the breast and uterus, and into the value of serological tests for diagnosis. An unusual research compared 500 patients of cancer of the breast with 500 controls; it showed that many supposed predisposing conditions had no influence in encouraging cancer. The predisposing significance of injury, infertility, and chronic mastitis was confirmed. The urgent need for further information leads to the suggestion that clinical notes should be supervised by someone of greater experience than the student, and that efforts be made to obtain and maintain records as complete as possible. A form of follow-up system is being instituted in the large county borough hospitals, and it is hoped to extend it. All clinical data collected are submitted to careful analysis, and if the deductions are adequately supported a report is prepared for the use of the profession. Six such reports and five circulars to public health authorities have been issued.

The returns of medical officers of health indicate that there is still room for further improvement of notification of tuberculosis; many cases are not notified before death and still more only during the last six months of life. The decline in the number of deaths from phthisis is gratifying but unexplained, save as the result of the public health campaign. On Feb. 1st, 1927, there were 442 dispensaries in England, 69 special centres, and 367 tuberculosis officers. The work has advanced considerably in most districts; there is increased coördination under orthopædic schemes and with school medical officers; X ray diagnostic installations have been provided at many dispensaries and private doctors show increasing readiness to send cases. There is need for careful comparison of the results of sanatorium and home treatment. Experience has shown that adults cannot be trained in new occupations, and that treatment must be followed by a long period of safeguarding, most effectively secured in village settlements. Such provision as is made by the "Factory in the Fields" and the Hull Care Committee may prove useful. The time is considered ripe for a few colony schemes to be tried experimentally. The second report on "sanocrysin" from the Medical Research Council[3] concluded that it is of value in certain carefully selected cases only. The Calmette method is being investigated.

Venereal Disease.

At the close of 1926 there were 190 treatment centres in England and Wales; the ratio of attendances to cases showed a further increase during the year. Careful follow-up work has reduced the number

[3] THE LANCET, 1926, ii., 181.

of defaulters, and the location of centres apart from hospitals does not seem to deter patients. A warning is sounded against inadequate treatment. A short course of arsenobenzol and mercury is often followed by relapse, and it is important that medical officers should be convinced of the necessity for prolonged treatment. Practitioners are reminded that the signs of venereal disease in pregnancy are often absent or very slight, and are urged to follow up the clue given by infected children or stillbirths. Treatment of the congenitally syphilitic child, also, should be commenced while the disease is latent and doctors should act on suspicion. Experience in Plymouth has shown that detection of the disease before it is manifest would considerably raise the standard of health of the population.

Maternity and Child Welfare.

This work has been expanded and the gloomy forebodings as to the effect of the strike on the physique and vigour of school-children were not fulfilled, partly as the result of provision of meals at school and the distribution of free milk. The maternal mortality-rate was 4·12, a slight rise. The importance of making provision for treatment of puerperal pyrexia and for antenatal supervision is stressed. There are now 772 antenatal centres, 105 homes for unmarried mothers, and 2324 infant welfare clinics. The report remarks that money expended on centres and health visitors brings perhaps a greater return than any other form of expenditure on maternity and child welfare, and points out that the Adoption of Children Act, 1926, may prove prejudicial to the welfare of illegitimate children, whose foster mothers may adopt them to avoid supervision. Although provision for ophthalmia neonatorum is good in most areas there still seem to be administrative loopholes, and the responsibility for notification has now been laid wholly on the medical practitioner.

The care of the pre-school child is described as a problem awaiting satisfactory solution. Dr. Margaret Hogarth's examination of 1000 unselected children of 3 years of age revealed a large amount of preventable disease, but also created an impression of a much higher standard of parental care than was evident ten years ago. The most striking feature was the prevalence of rickets, the forerunner of all that is required to produce a C3 nation. The effects of treatment by sunlight and cod-liver oil appear to wear off when the course is discontinued. Diseases of the throat, nose, and ear formed an important group of defects, and the prevention of otitis media and of the sequelæ of enlarged tonsils and adenoids alone make systematic supervision desirable. Special attention is drawn to the danger of forgetting the mental development of the child through focusing attention on his physical welfare. The Conference on Child Welfare, held at Geneva in September, agreed to investigate the value of preventive measures against scarlet fever, diphtheria, and measles, to prepare a note on the arrangements in different countries for the training in pediatrics of doctors, nurses, and health visitors, and to hold an inquiry into infant mortality in selected districts over a period of 12 months. The areas chosen in England were Sunderland and parts of Staffordshire (high rate); Croydon and Oxfordshire (low rates). This is the first international inquiry of the kind, and is to be clinical rather than statistical.

National Health Insurance.

The number of persons entitled to benefit in 1926 was 14,102,000, one-third of the population, breadwinners on whose health and capacity the living of the great majority of the remainder was dependent. Increase in the number of certificates during the strike and in the aggregate cost of prescribing are commented on. Late in the year six full-time regional dental officers were appointed and dental benefit is now almost universal. More than £400,000 a year has been allocated to ophthalmic benefit. The statement that the service "does not tend to the prevention of disease" is strongly combated and the educational work carried on by panel committees is reviewed.

Food in Health and Disease.

Gratification at the awakening of public interest in diet is expressed, and caution and discrimination in making didactic statements are called for. Recent research has shown that the keynote of a successful diet is variety and has thrown doubt on the belief that primitive man was better off in regard to his diet than man of the present day. It is pointed out that this country is eminently suited to the production of the essential foods, milk, and vegetables, and that they should be distributed widely and cheaply enough for them to be in everybody's daily diet. Describing the improvements in milk preparation the report states that there has been a satisfactory increase in the amount of Grade A (T.T.) milk supplied. Great stress is laid on coöperation between M.O.H., public analyst, and sampling officers. There is immense and continuing improvement in purity of foodstuffs, and more tests for preservatives were carried out during the first two months of the year than during the whole previous decade. Analytical methods need revision, especially for traces of boric acid, and this has been the main work of the laboratory. Forty-eight food-poisoning outbreaks are reviewed.

Research Work.

Work on the hæmolytic streptococci has been published and supports the view that these organisms are the cause of scarlet fever. Some research on pneumococcal virulence and immunity will be completed shortly. A good deal of statistical analysis was done for the Scarlet Fever Committee and on school anthropometry. The factors in puerperal mortality have been investigated, as have also the incidence of disease in cotton-spinners in wet and dry sheds, and health in the printing industry. It is becoming clear that the conception of herd immunity as distinct from individual immunity is a very important one for prophylaxis. The steady increase in the number of requests for advice and help in research work arising out of the ordinary duties of medical officers is viewed with great satisfaction as the most valuable work of the department. A review of progress in artificial light treatment lays stress on the necessity for medical control and supervision. A disquieting increase is noted in the deaths from anæsthesia, and the Ministry is anxious to ascertain the real fatality ratio and to relate it to different anæsthetics and methods of administration.

International Health.

The report concludes with a review of the work of the League of Nations Health Committee, the Office International, the International Sanitary Conference in June, and the International Pacific Health Conference.

Other chapters deal with the Port Sanitary Authority and the Poor-law.

THE SPREAD OF TUBERCULOSIS.

EXAMINATION OF CONTACTS.

THE eradication of tuberculosis depends on the solution of a problem that has hitherto baffled an army of investigators. The problem is concerned with the manner of its spread. A husband, for instance, is consumptive; his wife, subject to daily and nightly opportunities for infection, apparently escapes the disease. One child, perhaps, dies of miliary tuberculosis, two or three children become "tuberculous seedlings," and after a school career, chequered by frequent visits to clinics, dispensaries, and sanatoriums, reach adult life without revealing any obvious signs of tuberculous disease. In another similarly infected family, by contrast, the children pass through school life apparently free from disease, but when adolescence is reached, one or more of them suddenly develops signs of active phthisis, possibly many years after the death of the consumptive parent. In some cases the tragedy of "Wuthering Heights"

is repeated and a family is decimated; in others a single member of the second generation succumbs. Not infrequently, again, an adolescent or young adult develops phthisis although the family bill of health is clear of any taint of the disease and no source of infection can be traced. The origin of the chronic fibroid type of tuberculosis common in later life is equally uncertain, and it is often doubtful in any particular case whether the infection is of recent date or whether declining vitality has caused a smouldering fire to blaze.

Where much is obscure certain facts are patent. That a member of a family suffering from manifest tuberculosis is a grave source of danger to all its members has been recognised since Koch's discovery, and, indeed, was recognised before it, and provision for the examination of contacts is considered to be an essential part of all antituberculosis schemes. When a case of tuberculosis is notified a health visitor calls at the home of the sufferer, and though the adolescent members of the family are apt to decline to attend the dispensary, maternal anxiety can usually be depended upon to produce two or three infants or children of school age. These are martialled before the tuberculosis officer, a physical examination is made, the signs of manifest tuberculosis are lacking, and a much-relieved parent returns with her wondering offspring to the home where infection abides. Finally, a record of negative results for the contacts is duly returned to swell the satisfactory statistics of the county medical officer, regardless of the fact that to pronounce an infant "free from any trace of the disease," because auscultation and percussion fail to reveal obvious signs of tubercle is about as useful as to palpate its chin and report that there is no evidence of a beard.

The familial spread of tuberculosis can never be prevented by such perfunctory methods and slipshod work. It is notorious that pulmonary tuberculosis is only recognisable by physical signs in the chest when the disease is firmly established. The "early case" of the sanatorium is not an early case of tuberculous infection; the sound of cracking timbers, the fall of decayed masonry are not the signs by which a housing inspector determines incipient decay in a building. For too long the threatenings of imminent collapse have been mistaken for the first warnings of danger. The slogan of the propagandist, that consumption is curable in its early stages, is only true if applied to stages whose detection requires far greater delicacy than that of palpation, percussion, and auscultation.

In this connexion the work of E. L. Opie and F. M. McPhedran,[1] of Philadelphia, deserves more attention than it has yet received in this country. Their investigation of tuberculous contagion in families has been based upon evidence obtained from the intracutaneous tuberculin test, correlated with information from skiagrams, and supplemented by the usual physical examination. In this way both contact and non-contact families have been subjected to a searching examination, the results for each family being set out on an ingenious record card showing diagrammatically the condition of each member as revealed by the various tests employed. The age of each member is also shown and the duration of exposure to infection in the case of "contact" families is graphically indicated.

The tuberculous are divided into (*a*) those with manifest disease recognisable by physical signs, sputum tests, &c., and (*b*) those with latent disease only revealed by radiographic examination and tuberculin tests. Latent infection in the child is due to implantation of the tubercle bacillus in the lymphatic system of the lungs and is revealed by nodes in the lung field or by enlargement of the tracheobronchial glands; the radiographic appearance of these foci has been compared with post-mortem findings and their significance has been proved. The adult type of latent infection—which is, however, occasionally found in children—is characterised by involvement of the lung apex, which may be the seat of tuberculous deposits or may exhibit a thickening of the apical cap. It is claimed that the X ray findings are confirmed by the intracutaneous test, though the latter is more delicate and supplies evidence of infection at an earlier stage.

If the conclusions of Opie and McPhedran are correct, they ought to be generally applied as far as may be possible. They are as follows:—

1. When latent tuberculosis is taken into consideration, tuberculosis exhibits the characters of a contagious disease and affects all children of households within which some members, suffering with tuberculosis, scatters tubercle bacilli.

2. Recognition of latent apical tuberculosis has demonstrated that tuberculous infection is transmitted to adults and to adolescent children, and has shown that approximately one-half of the partners of husbands and wives with open tuberculosis are infected after marriage.

3. Duration of exposure to open tuberculosis is an important factor in determining the character and severity of the resulting infection; in instances of recognisable tuberculosis of tracheobronchial lymph nodes the average duration of contact with tuberculosis has been approximately four and a half years, and instances of latent apical tuberculosis nearly twice as much.

4. Dispensaries for the care and control of tuberculosis should be organised so that spread of latent infection within the family may be recognised and prevented. A chart for each family, depicting the severity of latent and manifest disease disclosed by quantitative tuberculin reactions and roentgenological examination, will forcibly direct attention to effective means of control.

5. Latent tuberculosis often becomes manifest. Certain forms of latent infection foretell the approach of clinically recognisable disease. These are (1) infection recognisable by the tuberculin reaction during the first two years of life, (2) tracheobronchial tuberculosis in children recognised by roentgenological examination, and (3) latent apical tuberculosis in adolescent children. Children with these forms of tuberculous infection should be examined at frequent intervals and treated as though they had recently arrested tuberculosis.

6. All adults in whom latent apical tuberculosis has been recognised should receive the same care as patients with arrested phthisis.

[1] The Contagion of Tuberculosis. By Eugene L. Opie, M.D., and F. Maurice McPhedran, M.D. The American Review of Tuberculosis, October, 1926. Spread of Tuberculosis within Families. By Opie and McPhedran. Journal of the American Medical Association, No. 1926.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Abortion in Russia and in Germany.

THE Breslau Medical Society recently discussed the consequences of legalised abortion in Russia. The new legislation in that country recognises no difference between children born in and out of wedlock, and the Soviet has decreed that any abortion sanctioned by a medical commission and performed in a public hospital by a doctor will not be regarded as criminal. As a result of this decree so many women applied for abortion that the hospitals were soon overcrowded and private sanatoriums had to be used. The Soviet authorities intended that abortion should no longer be concealed, and that women who wished their pregnancy to be interrupted should be able to get this done under favourable circumstances. They wanted to prosecute those who make a business of artificial abortion, and not the mothers who seek to have the operation performed. Needless to say, the result has been a great increase of abortion, and according to Dr. Niedermeyer, who opened the discussion, only a nation of such vitality as Russia can stand such legislation. Abortion performed by

quacks for money is now rare, though it has not yet disappeared. Septic complications have very much decreased, as abortion in the great majority of cases is performed under hygienic conditions. This is, however, the only favourable aspect of the new régime. It is stated that repeated abortion causes various troubles, and Russian gynæcologists in this connexion report injuries to the uterus and neighbouring organs, concretions which have produced severe complications at later pregnancies, and mental disturbance. Placenta prævia and atony of the uterus during labour have become more common. Dr. Niedermeyer warned Germany not to follow the Russian example.

In the discussion Dr. Rosenfeld stated that although artificial abortion is a criminal offence in Germany, nevertheless about 500,000 abortions are performed annually—some even put the figure at 800,000—and only 1000 to 2000 offenders are prosecuted. The number of cases in which pregnancy is prevented by contraceptives and pessaries cannot be ascertained by statistical means. Germany has, notwithstanding, an annual surplus of more than half a million. Since legislation against artificial abortion is thus ineffective, it is desirable that it be performed not by quacks but by qualified medical men. Prof. Fraenkel, head of the gynæcological clinic at Breslau University, said that abortion, even if performed under the most favourable conditions, led to disease much more frequently than did normal birth. Leaving aside all political and social arguments, he warned the faculty against performing abortion on other than strictly medical grounds.

Under the present German criminal law interruption of pregnancy is always a crime, no exception being made for medical men, even if it is urgently necessary in order to preserve the life or health of the mother. Prosecution of medical men has been rare, but has occasionally been proceeded with on anonymous and other information. It is therefore satisfactory that the High Court at Leipzig has lately given a judgment which will protect medical men against these unpleasant incidents. The opinion of the medical profession, and of some legal authorities also, that a special professional right exists to interrupt pregnancy on urgent necessity is not maintained by the High Court, and a verdict of "not guilty" has been given on other grounds, less comprehensible, but none the less satisfactory to the medical profession. The court states that the interruption of pregnancy by a medical man may be technically criminal abortion . . . but that there is no criminal offence unless there is also criminal intent. The life of the mother must be valued higher than the life of the child in the womb, and if an abortion is the only chance of saving the mother's life it is not to be considered criminal. It may be noted that the new criminal bill now under consideration contains a clause that artificial abortion is not criminal when performed by a qualified medical man who considers that according to the principles of medical science no other course can save the life or the health of the mother. The same principle holds good for perforation of the skull during childbirth.

Congress of Sick-Clubs.

The annual congress of sick-clubs under the Workmen's Insurance Act was held this year at Königsberg, where 1400 delegates met, representing 10½ millions of insured persons; the government was also represented. The president alluded to the care taken by the clubs not only of the sick, but also of convalescents and children; he also mentioned the agitation against the clubs in a sentence which, without mentioning the medical profession, was obviously directed against its leaders. Dr. Stein, of Geneva, spoke on the international insurance of workmen, and Prof. Adam invited the clubs to assist the work of the Association for Health Instruction; a resolution in favour of Prof. Adam's proposals being unanimously adopted. Other addresses urged the clubs to assist in the campaign against venereal disease, infant mortality, and occupational diseases. The meeting one more showed the strength and importance of the clubs. Their position has, unfortunately, been won partly in the face of medical opposition and to the prejudice of the profession.

X Rays in Hospitals and in Private Practice.

In Germany there is a marked tendency among the public to underestimate the work of private medical men, and to resort as much as possible to hospitals and sick-club institutions. The public believes that these institutions have more modern methods of cure than the average medical man or the private specialist, and that treatment is more effective if given at places where there is a large staff. So far as X rays are concerned this opinion is refuted by a recent statistical record, in which the injuries to patients in public and private institutions are compared. Of the 19 genuine recorded cases of damage due to X rays used for diagnostic purposes, 16 occurred in public institutions and three in private practice. Two of the cases were due to negligence and 17 to insufficient knowledge. Of 59 genuine cases of injury in the therapeutic application of X rays, 29 occurred in hospitals and public institutions, and 30 in private medical institutions. It is stated that in 22 of these cases the medical man was in no way to blame, but that in 15 cases negligence, and in 23 insufficient knowledge, must be supposed, the cases being divided equally among hospitals and private institutions. About 45 cases of injury were recorded in hospitals and sick-club institutions, where the work is often done by young doctors or even by nurses. The private practitioner, on the other hand, has to do the work himself and on his own responsibility. The injuries caused by Rontgen rays were severe; ten cases were fatal, and amputations were necessary in others.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the 1926 statistics of six towns, five county boroughs, and one borough:—

Name of district and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Resp. diseases with influenza.	Heart disease.	Diarrhœa under 2 years.	Infant mortality.	Maternal mortality from childbirth.
Bristol (383,300)	17·3	11·4	1·13	1·24	1·9	1·6	6·0	70	3·5
Croydon (205,900)	16·9	11·0	1·01	1·60	1·5	1·3	7·5	61	7·0
Coventry (127,800)	16·5	10·3	1·15	1·13	1·5	1·1	4·7	69	4·7
Bournemouth (90,100)	12·3	13·5	1·04	1·96	1·8	2·5	5·4	58	3·6
Great Yarmouth (57,760)	16·7	11·8	1·05	1·71	1·4	1·6	5·2	58	4·1
Scarborough (39,740)	16·6	13·4	0·95	1·84	1·8	2·7	4·6	71	3·0

Bristol.

Dr. D. S. Davies suggests that just as we have protected the nursing staffs in our hospitals from diphtheria, "so every school and every institution ought to insist upon the protection of its scholars against diphtheria."

Several houses at Bristol have become infested with a mite (*Glycyphagus domesticus*) found in Algerian fibre imported for upholstery. These mites breed rapidly, and carpets, walls, and floors are quickly covered with a fine coating of the insects, like dust. The condition is difficult to eradicate because the mite

has a resistant cystic stage. Dyeing of the fibre appears to destroy it. The British Museum has published a pamphlet on this insect, which suggests that the best way of avoiding the trouble is "to refrain from buying furniture stuffed with Algerian fibre."

The Bristol Corporation Act of 1926 contains a section requiring adequate ventilation for gas geysers. Dr. Davies mentions that there is an idea prevalent that when Bunsen burners are provided a flue is not necessary because combustion is more perfect and the risk of the production of carbon-monoxide is less. He finds, however, that among seven cases of fatal gas poisoning at Bristol the Bunsen flame was used in three, and that it is, therefore, necessary to have a flue fixed in every case. The report contains illustrations of the right and the wrong methods for securing ventilation for geysers.

The increase in the accommodation at the isolation hospital, postponed owing to the war, has now been completed and the 56 additional beds will be brought into use during the current year. Three nurses are employed to visit all kinds of infectious diseases at home. When a first case of measles occurs in an infant department, the class-contacts are excluded from the ninth to the fifteenth day and placed under the supervision of one of these home nurses. Bristol has been fortunate as regards small-pox. During the last 43 years there have been 102 introductions, 23 through the port. The total cases numbered 1243 with 127 deaths. Since 1917 there have only been two introductions, both through the port. One, in 1921, caused seven cases with one death, and the other, in 1924, one case with no death. Dr. Davies thinks that the value of isolation hospitals for scarlet fever is not put fairly when a comparison is made as regards return cases between home treatment and hospital treatment. His experience during the last six years in Bristol shows that 4237 primary cases removed to hospital were followed by 284 secondary cases, whereas 3918 home-treated cases were followed by 513 secondary cases. A chart in the report shows the great increase in poliomyelitis and polio-encephalitis in several of the counties during 1926, Leicestershire and Nottinghamshire being prominent examples. In view of the possibility of a similar increase in Gloucestershire, Dr. Davies gives a list of preventive measures. At a conference of representatives of the health committee, education committee, and board of guardians a resolution was passed expressing the opinion that post-encephalitics cannot be suitably dealt with under the Mental Deficiency Act, and that what is required is a healthy outdoor life under skilled discipline in an institution apart from mentally defective or insane persons. It was also pointed out that there is ample provision for present needs in the Poor-law hospital at Southmead, and that there is no justification for pressing the Ministry to sanction the provision of special accommodation for the Bristol area. Among the 48 notifications of ophthalmia neonatorum were two cases where infants blinded in both eyes were admitted to hospital for treatment from outside the city.

One of the health visitors "is now fully occupied in dealing with cases where increase or re-establishment of the supply of breast milk is desirable and the feeding and management of weakly children." This visitor gives lectures in turns at the 22 schools for mothers conducted by the Bristol Infant Welfare Association. Recommendations for the increase of the number (21) of health visitors are under the consideration of the Ministry of Health.

At the isolation hospital severe cases of scarlet fever improved rapidly with scarlet fever anti-toxin, and it is suggested that the favourable mortality-rate—only one death among 515 admissions—may have been due to this cause. Of 50 samples of milk examined for tubercle three gave a positive result.

Croydon.

Dr. H. P. Newsholme reports that the public laboratory, provided jointly by the Croydon General Hospital and the Corporation, began work in April, 1927. The new clinic premises and sick nursery in Lodge-road came into use at the beginning of 1926 and has proved a very real success. The nursery on the first floor provides accommodation for 12 ailing children under 5 years, also an isolation cubicle and a ward for two nursing mothers. The ground floor of the building accommodates the various clinics required by the education and health committees. The opening ceremony was performed by Princess Mary on May 18th, and early in 1927 the gift of a mercury-vapour lamp was received from the mothers and workers at the South Croydon Infant Welfare Centre. The number of mothers who attended the antenatal clinic during 1926 was 659. The total births were 3477.

Arrangements have been made with the Surrey County Council for the admission of small-pox cases into Clandon Hospital; this enables the joint small-pox hospital at Cheam to be used as a sanatorium for tuberculosis. The number of beds at Cheam have been increased from 50 to 85 since April, 1926, and Croydon has 40 of these beds, 25 for men and 15 for women. During the year about 10 per cent. of 3874 working-class houses inspected were found to contain one or more overcrowded rooms. In 117 cases it was found possible to abate the overcrowding without producing overcrowding elsewhere. The municipal lodging-house contains 101 cubicle beds and the average number of lodgers was 100 men per night. The charge is 9*d*. per night and 5*s*. per week. The receipts for the last three years were £1182, £1346, and £1338, and the expenditure £1350, £1485, and £1639.

The following samples of graded milk were examined during the year: Certified, 7; Grade A (T.T.), 5; and Grade A, 9. All of them conformed with the requirements. Out of 247 samples of milk examined for tubercle, two gave a positive result. The chief items of note in the school report are the growth of the dental scheme and of the scheme for dealing with crippling conditions. In April the second whole-time dental surgeon replaced a part-time dentist. Of 9393 children examined, 68 per cent. had defective teeth as against 75 per cent. in 1925 and 82 per cent. in 1924. The children dealt with for crippling conditions numbered 244, 72 from the maternity and child welfare, 132 from the school medical, and 40 from the tuberculosis departments. The orthopædic clinic is conducted by an orthopædic surgeon at the Croydon General Hospital, where in-patients requiring short periods of treatment are admitted. Those needing prolonged treatment are sent to Pyrford Orthopædic Hospital. During 1926, 11 children were admitted to the Croydon Hospital and nine were sent to Pyrford. Dr. Newsholme again draws attention to the need for an open-air school for anæmic debilitated children, numbering over 250, who cannot derive proper benefit from education in the ordinary elementary schools.

Coventry.

Dr. E. H. Snell reports that an automatic air pollution recorder has been in use since November. The scheme for a public abattoir has gone a step farther, the Council having approved of the erection of an abattoir at Whitley at an estimated cost of £21,757. The site adjoins the railway. Its area is five and a half acres. Two acres is to be utilised at once, the remainder being available for extension. The scheme is intended in the first instance to provide accommodation for butchers who have none. The slaughter-houses in existence at the end of 1926 numbered 46, 11 registered and 35 licensed. There is already a dead meat market in Barrack-square. The meteorological report shows that the rainfall was 27·66 inches and the hours of bright sunshine 1167. A chart indicates that the whole of the recent decline in infant mortality has occurred between the ages of 4 weeks and 12 months, and that the neonatal mortality has been practically stationary since 1905. In the more recently developed portions of the city separate sewers have been installed for foul and surface water. An important scheme for laying further

storm-water relief sewers has now been approved by the Council.

It was only possible to deal adequately with very serious cases of overcrowding owing to the shortage of houses. Details are given of eight such cases, of which we give the last: "The house contained one living-room and one bedroom. The bedroom, containing 1118 cubic feet, was occupied by a man, wife, four daughters aged 15, 7, 3, and 1 year, and four sons aged 14, 10, 9, and 5 years respectively."

The milk-supply in 1926 averaged 4700 gallons per day and exceeded demand, nearly half the total quantity is pasteurised and sold in bottles. One of 42 specimens of milk from 39 farms was found to contain tubercle bacilli, and as a result two cows from an outside farm were found to be tuberculous and were slaughtered. A table, which has been compiled since the Council first provided sanatorium beds, shows the present condition of the ex-sanatorium patients. Thus, of the 956 patients treated during the ten years 1909–1918, 240 were known to be "remaining well" at the end of 1926. The tuberculosis officer, Dr. J. McG. Williams, reports that, from the summer of 1925 to the end of 1926, 50 patients were treated with sanocrysin at the Memorial Sanatorium, and that 42 had completed their treatment. In five cases the treatment was unsuitable and discontinued, 22 patients improved, six showed no improvement, three became worse, and six died. If the improvement in the 22 patients is lasting, says Dr. Williams, it may be concluded that sanocrysin is beneficial in certain cases, but years must elapse before the final results can be judged with accuracy.

The percentage of patients who keep up their attendance at the venereal diseases clinic has improved from 82·6 to 86·7 per cent. The infant welfare centres are being used both for the instruction of school-girls between the ages of 13 and 14 and for pupil-midwives; 141 school-girls attended during 1926 and eight pupil-midwives. An antenatal clinic is conducted by a gynæcologist, Dr. S. A. Ballantyne, at one of the welfare centres. Of the 251 cases seen 233 were booked for maternity hospitals, eight were sent by midwives, eight came of their own accord, and two were not pregnant. The total births in Coventry during the year numbered 2116.

Bournemouth.

This report is issued under the name of the late Dr. A. D. Edwards, the medical officer of health. The public analyst, Mr. R. A. Cripps, points out that the three samples of cream sent to him contained only 25 per cent. of fat, "or rather less than half that usually found in cream." He thinks that the Ministry should issue an order defining cream as containjng from 40 to 70 per cent. of fat, and compelling the vendors to state upon the label the approximate proportion of contained fat. Of the 18 samples of sausages examined six contained sulphur dioxide and four boric acid. Since Jan. 1st, 1927, the use of boric acid has been prohibited.

Great Yarmouth.

Dr. A. N. Stevens reports that there is no shortage of midwives and that it is customary for medical practitioners to be engaged for confinements. Over two-thirds of the births during 1926 were attended by medical men. Only 75 per cent. of the total live births were notified to the medical officer of health. Of the infants visited during the year, 82 per cent. were found to be breast-fed during the first month, 64 per cent. during the fourth month, 59 per cent. during the eighth month, and 34 per cent. during the twelfth month.

Scarborough.

Dr. S. Fox Linton reports that 139 new houses were built during 1926, as compared with 332 in 1925. The houses built with State assistance numbered 93, as compared with 296. Housing conditions are bad in part of the town. The area represented as unhealthy by the medical officer of health in January, 1924, has not yet been dealt with. The corporation subsidise one bed at a nursing home for maternity cases, the cost being a retaining fee of £5 and £4 4*s*. per week when the bed is occupied. Twenty patients used the bed for a total of 41 weeks. The question of adopting the model by-laws for slaughter-houses is being discussed. Dr. Linton's report in favour of the use of the humane killer shows that there is little or no objection to the use of a humane killer for cattle and sheep, and that the objection in the case of pigs appears to be negligible. There are slaughtering establishments in Sweden which specialise in exporting, and from which bacon is exported to England, where humane killing is obligatory. Among adverse sanitary circumstances Dr. Linton reports the existence of about 920 houses with privies, and an unknown number of privies attached to houses with water-closets. Four-fifths of the refuse is disposed of by tipping and a tip close to the new corporation housing estate has caused complaints during the year. Six samples of bread and butter were obtained at local restaurants and in three instances were found to consist of bread and margarine. Fines of £3 each were imposed. The hours of bright sunshine totalled 1412, or about 50 hours less than the annual average for 35 years.

SCHOOL MEDICAL SERVICE.

THE following is a summary of the three school reports under notice:—

Name of district.	No. on roll.	Av. elem. school attendance.	No. of routine children examined.	No. of special examinations and re-inspections.	Percentage of children found on routine examination requiring treatment.*
Nottingham .	40,838	35,547	11,551	25,704	17·4
Shrewsbury .	4,000 (approx.)	3,896	1,178	7,726	9·2
Carlisle.. ..	8,029	7,044	2,724	6,215	20·7

* Excluding uncleanliness and dental defects.

City of Nottingham.

A feature of the report by Dr. E. M. Wyche, senior medical officer (education), is an illustrated account of orthopædic work in the city. Mr. S. A. Malkin, the orthopædic surgeon, says that "not the least gratifying feature of the year's work has been the fact that some of the children who last year attended for orthopædic treatment have this year left school fully able to take their place in the business and industrial life of the city . . . . But for the committee's orthopædic scheme, many of their disabilities, now happily removed, would necessarily have been neglected until complete breakdown and much needless suffering had occurred. No less than 63 children have been discharged cured—a permanent gain to the community as well as to the individual concerned." This useful work will shortly be facilitated by the establishment of a country hospital school. The city can be justly proud of its open-air schools. The combined accommodation is for some 385 children, which seems generous in comparison with that of many other towns, but there is need for substantial increase in the south-east part of the city. Dr. Wyche gives in a few lines a summary of the history of school health work in Nottingham since 1907, each year or two showing some development. Even now, he says, not less than one-fifth of the school population is found defective from one cause or another, many of which should not be allowed to continue. It is often forgotten, moreover, as he points out, that these figures give a somewhat optimistic view, since they take no note of children who are at home ill, or in special schools and institutions. On the other hand, an apparent rise in incidence of defect may be due to exceptionally thorough investigation which will bear fruit later.

The consultant aural surgeon, Mr. H. Bell Tawse, welcomes the opening of a new department in a clinic,

and remarks that "now the medical officers see their own cases up to and through the stage of operative treatment and subsequently can follow their progress up to complete recovery. The progressive widening of the scope of the medical officers' duties, and the improvement of the conditions of service, are matters of infinite importance; it is in this way only that the committee can obtain the best and keenest types of recruits to fill vacancies in their medical staff. Entrusted to capable hands, the school medical service should become our most effective instrument for the prevention of needless disease and disability.

Shrewsbury.

Dr. A. D. Symons is to be congratulated on his report for 1926. The health of the children of Shrewsbury may be considered very satisfactory. The percentage of children found to require treatment on routine medical inspection was very low (9·2 per cent.). He attributes this to four possible causes: (1) environment (absence of large quantities of industrial smoke, open spaces and playing fields, the equable climate); (2) absence of poverty or unemployment as found in some industrial towns; (3) the cumulative effect of child welfare work in the borough; and (4) the provision made by the education committee for the health and welfare of the children. He gives an interesting hypothetical case illustrating the coördination between the various agencies responsible for the health and welfare of children from birth to adolescence. With regard to vaccination, it is pointed out that of 2854 children, admitted to school during the last seven years, 1199, or 42 per cent., were unvaccinated; in other words, only just over half of the present elementary school population in Shrewsbury is protected—and even then only partially protected—against small-pox. Dr. Symons discusses the difficulties in administrative control of infectious outbreaks in the school. A pamphlet is reproduced giving directions for the treatment of impetigo in the home.

Extracts from the replies of the head teachers on the subject of cod-liver oil and malt in the schools are illuminating. Dr. Symons states that the cost of supplying the cod-liver oil to 179 children was £30. Eighty-nine per cent. of the children much increased in weight. The treatment he regards as preventive, and the small amount of malt and oil may just turn the balance in many cases by warding off tuberculosis or other infections. He goes on to say that it is more economical to spend £30 a year on 179 children in this way than to wait until they become casualties. It would cost the same sum of money to maintain one child as a tuberculous cripple at the orthopædic hospital for 12 weeks only.

There are no special schools for mentally defective children in the borough, and it has to be borne in mind that the state is difficult to detect. Each individual case has to be examined in a thorough manner, mentally and physically, and this examination cannot be done properly in less than one hour. This responsibility must, however, be faced, for experience has shown that it is necessary at the earliest possible moment to separate the three classes: (1) those who can be taught in an elementary school; (2) those who can be taught only in a special school; (3) those unfit for any school.

City of Carlisle.

Dr. Joseph Beard, M.O.H. and S.M.O., notes that there were 95 less routine inspections than in the previous year, the decrease being in the later age-groups. The number of routine inspections was larger among entrants, showing the continuing effect of the increase in the annual birth-rate which followed demobilisation. The percentage of defects is considerably lower, 6·37 less than in 1925 and 12·7 less than in 1924. The decrease is most marked in non-tuberculous lung disease, in tuberculous conditions of all sorts, and in anæmia and malnutrition—conditions that are specially important for the outlook in later life. Cleanliness is also more usual, the apparent paradox of a greater number of exclusions for verminous conditions is explained by the greater number of inspections and especially the surprise visits paid by nurses for this purpose. The rearrangement of the surprise visits is expected to lead to a marked improvement in cleanliness in the future. Dr. Beard gives a list of the schools with the number of unclean children in each; such lists may have a good influence by stimulating a competitive effort to be the cleanest school in the town. Dental work is satisfactorily carried on, the fillings of permanent teeth being three and a half times as many as the extractions, and as Dr. Beard says, that experience shows that any conservative work that has been done proves to be of a lasting nature, and that the general cleanliness of the teeth of all groups is well maintained. It is certainly to be regretted that the percentage of refusals of dental treatment (37·2) is so high, because the children in this group are at an age when the six-year molars can be satisfactorily treated; it is surprising since the number of parents attending medical inspections is good (54·17) and increasing.

There are as yet no special schools in Carlisle, nor any adequate orthopædic scheme, though for delicate children there are the Newtown delicate classes and 66 children were sent to the Sillath Convalescent Institution through the medium of the Council of Social Service, which also provides a voluntary clinic for the treatment of cripples. It is evident that there is need for a properly equipped open-air school, a complete orthopædic scheme, and schools for the physically and mentally defective.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 27TH.

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 166 (last week 103); scarlet fever, 1354; diphtheria, 705; enteric fever, 103; pneumonia, 384; puerperal fever, 41; puerperal pyrexia, 115; cerebro-spinal fever, 7; acute poliomyelitis, 29; acute polio-encephalitis, 4; encephalitis lethargica, 23; continued fever, 2; dysentery, 7; and ophthalmia neonatorum, 115. No case of cholera, plague, or typhus fever was notified during the week.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox or enteric fever, 16 (1) from measles, 4 (2) from scarlet fever, 8 (3) from whooping-cough, 15 (2) from diphtheria, 72 (8) from diarrhœa and enteritis under 2 years of age, and 20 (5) from influenza. The figures in parentheses are those for London itself.

THE Lister Centenary Exhibition at the Wellcome Historical Medical Museum, 54A, Wigmore-street, will be closed on Oct. 1st. Since its inception in April the exhibition has been inspected by a large number of visitors from all parts of the world.

A CONFERENCE ON LIBRARIES.—Some 200 organisations will be represented at the Fourth Conference of the Association of Special Libraries and Information Bureaux, which is to meet at Trinity College, Cambridge, from Sept. 23rd–26th. After a reception by Sir J. J. Thomson (Master of Trinity College), Sir Geoffrey Butler, M.P., will deliver the presidential address. Among others who will read papers are Sir Henry Lyons, Mr. A. E. Overton, and Sir Richard Gregory. The subjects to be discussed include the recent report of the Public Libraries Committee, coöperation between libraries, and book selection in science and technology. Sectional meetings will be held on information and statistics in commerce and industry, on patent classification, and on information bureaux. The conference is open to all interested, and particulars may be had from the secretary of the Association at 38, Bloomsbury-square, London, W.C. As we have already announced, the Association is publishing in the autumn a directory of sources of specialised information, edited by Mr. G. F. Barwick, late Keeper of Printed Books at the British Museum.

Correspondence.

"Audi alteram partem."

EXAMINERS AND EXAMINEES.

To the Editor of THE LANCET.

SIR,—In connexion with the article by Dr. Alan Moncrieff in the Modern Technique in Treatment series on Diseases Associated with Examinations, which appeared in your Students' Number (August 27th), there is a proposal which I brought before the College of Physicians of Edinburgh over 30 years ago which would, I think, if adopted, prevent the occurrence of such disorders, at any rate to a very considerable extent. Let me briefly explain my meaning.

At a professional examination the factor which I believe acts most powerfully in inducing mental perturbation in the good student is what may be termed "the unknown." The natural remedy would therefore be to conduct the examinations, at any rate the oral and clinical parts of them, practically "in the open." In this way the prospective candidate, having had frequent opportunities of witnessing the examinations and of familiarising himself with their requirements, character and standard, would know well in his own mind when he was fit to pass and would, at the proper time, appear before his examiners with much less diffidence and anxiety.

Of course, in the adoption of such publicity some extra thought, consideration, and care would have to be exercised by the medical authorities as regards the practical arrangements and carrying out of the examinations. But, as we all must recognise, publicity is a thing that is always worth obtaining from the medico-sociological point of view, and one must not forget that publicity as regards professional examinations other than medical is no new thing. Moreover, I pointed out at the time that in a large medical school where there are many students to be taught and many candidates to be examined, publicity as regards examinations would present another advantage. This was that the hours and days spent in the examining of students instead of being, as at present, a loss to the teaching work, would become to it a most helpful and valuable adjunct.

I am, Sir, yours faithfully,

Edinburgh, Sept. 1st, 1927. ALEX. JAMES, M.D.

To the Editor of THE LANCET.

SIR,—Dr. Alan Moncrieff's judicious article in THE LANCET for August 27th on the treatment of disorders associated with examinations must assuredly have awakened memories, many unhappy, in the minds of every medical man and woman reading it. He deals chiefly with the examinee. May I, in a few lines, deal with the examiner? Though I was never "ploughed" in a medical examination, and though more than a score of years have passed since I qualified, my impressions of certain incidents at the Surgeons' Hall in London and at Cambridge remain unpleasantly vivid. An examiner is sometimes a gentleman; who could have any but kindly memories of that model of courtesy and consideration, Sir Clifford Allbutt? But could he be called a typical examiner? One of the worst types is the youngster, with a short and brilliant career, intolerant of less gifted mortals. Many other types, all objectionable in one way or another, could be described. We old ex-examinees know them so well that I need not describe them. How can they be eliminated or their malice assuaged? What consideration is at present paid by those who appoint examiners to courtesy, patience, and a sense of justice as necessary qualifications in an examiner? What may be a harmless gibe at other times may be a cruel taunt when the object thereof is passing through a real crisis in his life, nerves stretched to breaking point by months of over-work. About two generations ago a medical examiner had "savaged" a batch of examinees so effectively that a deputation waited on the university authorities and secured his dismissal. But for one such case, how many are there in which the cavilling, jeering examiner is free to continue to cavil and jeer? I have already indicated the possibility of one remedy. Another is to foster an opinion in favour of courtesy and fairness in examiners. It is with this object that I am now trespassing on your space. Yet another is to make every *viva voce* examination public, to allow anyone who wishes it to be present. A few years ago I witnessed a public *viva voce* at the University in Oslo and was impressed by its fairness. There may be yet other remedies; I hope so, for I am not sure that I have shown how to bell effectively that most catty of cats, a bad-tempered examiner.

I am, Sir, yours faithfully,

CLAUDE LILLINGSTON, M.D. Cantab.

League of Red Cross Societies, Paris, Sept. 2nd, 1927.

ANTISPECIFIC CYTOLYSINS AND MALIGNANT DISEASE: A HYPOTHESIS.

To the Editor of THE LANCET.

SIR,—Some two years ago[1] I argued as a probable hypothesis that the body in its reaction against malignant disease produces cytolysins which are nearly or quite as toxic to itself as to the tumour, and that malignancy is due not to the tumour but to these cytolysins alone. The weakest point in the argument appeared to be the doubtful existence of these antispecific cytolysins, for which, so far as I then knew, no direct evidence had ever been obtained. That much evidence now exists seems clear from Miss Kohn-Speyer's paper in THE LANCET of August 20th, and I would urge again that this hypothesis of malignant disease should at least be considered. It appears to explain very simply all the peculiar phenomena of malignancy, the fretting of tissues at the tumour's edge, the metastases, the cachexia; if this be so, why should we involve ourselves in needless difficulties by supposing a further virus in the tumour itself? If this hypothesis can be accepted it will greatly simplify our view of malignant disease, and may have an important bearing on its treatment. For if malignancy is not in the tumour, but wholly in the body's reaction to it, then evidently any tumour will cease to be malignant, if the body can be induced to ignore it. I am, Sir, yours faithfully,

Plymouth, Sept. 1st, 1927. C. R. CROWTHER, M.D.

THE TRIAD OF SALERNO.

To the Editor of THE LANCET.

SIR,—Sir Thomas Horder, in his MacAlister lecture on Diet and Dietists, reported in THE LANCET of July 16th (p. 103), alluded to "the old adage, ascribed to Swift, which states that the three best doctors are 'Dr. Diet, Dr. Quiet, and Dr. Merry-Man.'" J. J. Walsh, in his booklet on "Medieval Medicine" (1920, p. 55, n.), states that the opening lines of the 1607 edition of the English translation of the *Regimen sanitatis salernitanum* "deserves to be noted because they are the origin of an expression that has been frequently quoted since," going on to italicise the following couplet:—

Use three physitians still—first Dr. Quiet,
Next Dr. Merry-man, and third Dr. Dyet,

which is apparently a translation of an original

Si tibi deficiant medici, medici tibi fiant
Haec tria, mens hilaris, requies, moderata diæta.

This drives one back to the "offscourings of the Bodleian" that are said to have formed the substance, the flesh clothing the anatomical structure, of Robert

[1] Brit. Med. Jour., Jan. 23rd, 1926.

Burton's "Anatomy of Melancholy," which originally appeared in 1621. Sure enough it is to be found in Part II. (2.6.4.):—

"The merrier heart, the longer life; *a merry heart is the life of the flesh*, Prov. 14. 30. *Gladness prolongs his days*, Ecclus. 30. 22. and this is one of the three *Salernitan* Doctors, Dr *Merryman*, Dr *Diet*, Dr *Quiet*, which cures all diseases—*Mens hilaris, requies, moderata diæta*."

These three doctors, however, with Englished names, are to be found earlier than 1607; whether the idea from which they took rise is traceable to Salerno (as is probably the case) or not. In Dr. J. C. Bucknill's useful, but somewhat superficial booklet on the "Medical Knowledge of Shakespeare" (1860, pp. 26–27), there is a quotation from Bullein's "New Boke of Phisicke" of 1559, in the form of what Bucknill calls "the following good story," in which, to our surprise, the triad is to be found:—

"Once I fel into a great sicknes, and hitherto I am skant recovered of it, the surfite was so great; but counsail was geuen me, that I should not stay myselfe upon the opinion of any one Physition, but rather upon three: then said I: to retain three at once, requireth great charge, for those men to whome lives be committed ought liberal rewardes to be geuen. Then sayde my frend, they are good gentlemen, and no great takers. What be theyr names, said I: He answered saying: The fyrste was called Doctor Diet, the second, Doctor Quiet, the third, Doctor Merryman."

A new turn is given to the phraseology of the saying by Longfellow (1807–82) in his "Poetic Aphorisms," which were based on the seventeenth century *Sinngedichte* of Friedrich von Logau:—

"Joy and Temperance and Repose
Slam the door on the doctor's nose."

This is equally Salernitan with the others, although in this, its latest dress, it will be seen that *tibi deficiant medici* in a way that was not exactly intended by the compiler of the *Regimen sanitatis* of Salerno.

I am, Sir, yours faithfully,

Manchester, August 23rd, 1927. W. J. RUTHERFURD.

TEACHING OF SWIMMING.

To the Editor of THE LANCET.

SIR,—I have been in communication with the local education authority of Wandsworth concerning this subject, and I think it would be advisable to comment on the subject before the summer passes and interest in swimming is diminished.

Fourteen years ago the Wandsworth Education Committee taught children of both sexes under 7 years of age swimming. The teaching commenced in the month of May; the baths were emptied and cleaned, and then filled with tepid water; the girls and boys went on alternate days, three times a week each. The girls went in batches of 34 at a time; they were taught to swim on their faces, on their backs, and also the American side stroke. So all that is asked now is that the Wandsworth education authority would do now what they did 14 years ago. They do not do so; the L.C.C. have sought the assistance of the London Schools Swimming Association, and, acting on their advice, they refuse to consider the teaching of children under 7 swimming, because they feel sure that the Minister of Education would prohibit it. But they have not consulted him in any way; he has had no opportunity of expressing an opinion. There are three sets of people who ought to have their say in the teaching of swimming to these young children. First, the parents, who should be consulted as to whether they wish their children to be taught at so young an age, or whether they wish it to be postponed till they are 11 years of age or more (vide THE LANCET, July 17th, 1926, p. 160); secondly, the school education authority, who take upon themselves to decide the matter for everybody; and thirdly, the *health* authorities, who are ignored and they at least ought to be considered by THE LANCET—they probably do not know what is going on.

I am, Sir, yours faithfully,

WALTER EDMUNDS.

Carlton-road, Putney, S.W., Sept. 2nd, 1927.

ASTHMA AND ARTHRITIS IN ALTERNATION.

To the Editor of THE LANCET.

SIR,—I agree with Dr. Stone that it is not altogether unexpected that asthma should disappear during an attack of arthritis, but it is, I think, somewhat surprising that the patient should be free from acute arthritis during an asthmatic phase. The interesting point about the case I quoted, and also about Dr. Long's case, was that the patient never had both complaints together, and was never free from either one or the other. Incidentally, her asthma did not disappear during an attack of influenza.

I am, Sir, yours faithfully,

Dublin, Sept. 2nd, 1927. SYLVIA B. WIGODER, M.D.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments are notified: Surg. Capt. C. T. Baxter to *President*, for three months' post-graduate course. Surg. Comdrs. W. C. Carson to *Vivid*, for R.N. Barracks; H. H. Babington to *Repulse*, and J. S. Austin to *Malabar*, for R.N. Hospl., Bermuda. Surg. Lt.-Comdrs. A. G. Bee to *Maidstone*, amended orders; R. P. Ninnis, to *Vivid*, for R.N. Barracks cancelled; and C. N. Ratcliffe to *Pembroke* for R.N. Hospl., Chatham, temp., supy., amended orders. Surg. Lts. A. de B. Joyce to *Maidstone* and to *Vivid*, for R.M. Infirmary, Plymouth, amended orders; G. W. Garde to *Comus*, temp.

Surg. Lt.-Comdr. A. C. Anderson to rank of Surg. Comdr.

Lt. (retd.) B. T. Brewster to rank of Lt.-Comdr. (retd.).

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub-Lt. A. T. G. Thomas to be Surg. Lt.

Proby. Surg. Sub-Lt. D. C. Livingstone to *Furious*, for 28 days' training.

The Medical Department of the Admiralty announce that Surgeon Lieut.-Commander Allan Watt McRorie, M.B., R.N., has been awarded Sir Gilbert Blane's Gold Medal, he having obtained the highest aggregate marks at the examinations held in 1927 for promotion to the rank of Surgeon Commander.

ROYAL ARMY MEDICAL CORPS.

Capt. H. N. Stafford to be Maj.

The undermentioned Capts. to be Majs.: J. F. Bourke and S. J. L. Lindeman.

The undermentioned are secd. for duty with the Sudan Def. Force: Capt. R. J. Rosie, Capt. E. G. Dalziel, and Lt. J. D. Corner.

Surg. Capt. Philip Graeme Bentlif, from the R. Jersey Mila. L.I., to be Lt.-on prob., and relinquishes the rank of Surg. Capt.

Lt. P. G. Bentlif is secd. under the provisions of Art 205, Royal Warrant for Pay and Promotion, 1926.

Temp. Lt. W. D. Dyson relinquishes his commn.

ARMY RESERVE OF OFFICERS.

2nd Lt. W. H. Scriven, from Res of Off., R.A., to be Lt.

ROYAL AIR FORCE.

Flying Officer (Dental) A. P. McClare to Marine Aircraft Experimental Establishment, Felixstowe.

J. McCarren is granted a short service commission in the rank of Flying Officer for three years on the active list.

INDIAN MEDICAL SERVICE.

Lt.-Col. C. C. Murison to be Col.

Capt. Sorab Curshedji Contractor to be Maj.

T. Capt. Baldeo Singh Gill relinquishes his commn.

DEATHS IN THE SERVICES.

Surgeon Lieut.-Commander John Stephen McGrath, whose death occurred on June 29th, was born in 1893 at Rosario de Santa Fé, Argentine Republic. He went to Ireland at 10 years of age and entered Rockwell College, afterwards taking up medical studies at University College, Cork. He entered the Navy as a surgeon probationer in June, 1915, and served in the North Sea until 1917, when he graduated M.B., B.Ch., in the National University of Ireland. During the latter part of the war he served in the Eastern Mediterranean and he was on board *Glorious* at the surrender of the German fleet in November, 1918. After the war he served on the China Station and in the Mediterranean, being invalided from the Navy with the rank of surgeon lieut.-commander. Last winter he took a course of study at the Coombe Hospital, Dublin, but he was in poor health and had a severe attack of influenza in the spring. He died at Glasnevin, Dublin, at the age of 34, leaving a widow and a daughter.

Obituary.

WILLIAM JOSEPH TYSON, M.D. DURH., F.R.C.P. LOND., F.R.C.S. ENG.

Folkestone loses a distinguished citizen by the death of Dr. W. J. Tyson, which occurred on Sept. 5th. Dr. Tyson was notable both as medical practitioner and as man of affairs, and during the latter part of his life devoted much time to public work as chairman of the Royal Victoria Hospital and in other capacities.

Born at Folkestone in 1851, he was the son of Dr. William Taylor Tyson, and was educated at Queen's College, Taunton. He qualified in 1874 from Guy's Hospital, where he became house surgeon and obstetric resident. Two years later he took the Fellowship of the Royal College of Surgeons of England and set up in practice at Folkestone. In 1881 he graduated as doctor of medicine in the University of Durham and in 1889 became a Member of the Royal College of Physicians of London. At this time he was acting as medical officer to the Folkestone Hospital and was writing on a variety of subjects, reading numerous papers before the Clinical and Pathological Societies of London, in whose *Proceedings* they may be found. In the course of the next few years these papers attracted attention to his talents, and in 1901, during his third term of office as President of the Folkestone Medical Society, Dr. Tyson was elected a Fellow of the Royal College of Physicians. Throughout his professional life he continued his contributions to medical journals and they revealed an alert and observant mind. He also wrote two small books based on medical notes from his own practice. Dr. Tyson's early connexion with the Folkestone Hospital was continued as physician and he resigned this office only recently after nearly 50 years of constant service. He became chairman of the institution on the death of Sir Stephen Penfold. Some 20 years ago he was appointed a justice of the peace for Kent and at the time of his death was chairman of the Elham Division County Magistrates. For many years, also, he represented Christchurch, Folkestone, in the Church National Assembly, where his clear views and easy speech were much appreciated. During the war he acted as examiner and lecturer on Government service.

Dr. Tyson married the daughter of Mr. J. H. du Boulay, of Sandgate. His widow survives him with three daughters.

ARTHUR PERCY ALLAN, M.D. LOND.

Dr. Percy Allan, who died at his home at South Croydon on Sept. 2nd, was for 25 years one of the medical representatives on the standing committee of convocation of the University of London, and for the same period was medical secretary of the University of London Graduates' Association. He was born at Chislehurst in 1868, the son of Mr. John Allan, and was educated privately and at Birkbeck College. Graduating as M.B. Lond. in 1894, he became clinical assistant, and later house physician, at Guy's Hospital. After finishing his house appointments he settled down to make a practice in Croydon, and succeeded in doing so under considerable difficulties. "He was an admirable practitioner and a bonny fighter," writes Dr. Graham Little, "and those who knew the medical school of Guy's in the early nineties will hear of his death with a very especial pang of sorrow. Throughout his life he retained the boyish freshness and ardour—and the engaging lisp—which endeared him to his fellow students." Dr. Allan was honorary surgeon to the St. John Ambulance Association, and during the late war did good service as medical officer in charge of one of the auxiliary military hospitals, receiving the Médaille du Roi Albert. He wrote on many medical subjects, besides having wide interests outside his profession. He was a profound student of Rabelais and had devoted much time to mythology and symbolism. A great deal of his leisure, however, was given to the University of London and he took an active part in the elections to the Senate, possessing a real flair for electioneering.

Dr. Allan married the daughter of Mr. Richard Clark, and she survives him.

WILLIAM THOMAS EVANS, M.B., C.M. EDIN.

Dr. W. T. Evans, who died on Sept. 3rd at Bromley, Kent, was the son of the late Mr. Charles Evans, F.R.C.S., and was born at Bakewell in Derbyshire in 1853. He was educated at Derby School and in 1870 proceeded to the University of Edinburgh, where he graduated in medicine five years later. After holding the post of resident house surgeon at the Edinburgh Royal Infirmary he settled in practice in West London and took up a number of public appointments, being medical officer of the West District, Paddington, and of the St. John's Training School for Girls, Westbourne Park. On retirement from practice in 1920 he went to live at Bickley in Kent. His death, which followed a fortnight's illness, occurred from heart failure. Dr. Evans married a daughter of the late Mr. Thomas Hughes, and his widow survives him with three children, one of whom is Major D. G. Evans, R.A.M.C.

FRANK PERCY ELLIOTT, M.B., C.M. ABERD.

AFTER some 35 years of practice at Walthamstow, Dr. F. P. Elliott died suddenly on August 30th at the age of 57. He came of an old Sussex family and was born at Jamaica, where his father and uncle were engaged in sugar-planting. Graduating in medicine at the University of Aberdeen in 1894, he accepted a locum tenency at Walthamstow and thus began his connexion with the district. He became attached to numerous institutions in the neighbourhood and notably to the Walthamstow Public Dispensary, of which he was senior medical officer. He was especially interested in infant and child welfare, and in 1915 established a child welfare centre at Walthamstow with beds for serious cases. A limited instalment was provided for the treatment of rickets by light, but the facilities then available did not fully satisfy him, and early this spring he acquired a large house and garden for the centre. The house contained a large installation for electrical and ultra-violet light treatment, and Dr. Elliott took it over only eight days before he died, expressing the hope that his medical friends would avail themselves fully of the opportunities afforded for treating their patients at the centre. Dr. C. W. Chapman, to whom we are indebted for some of these particulars, writes of his old friend as follows: "The outstanding feature of Dr. Elliott's character was the obliteration of self-interest in unstinting service to others. He typified the highest ideal of the family doctor and gentleman, and his relations with his professional colleagues were of the highest order." Dr. Elliott's hobby was his rock garden, and he had a remarkable knowledge of flowers in general.

NEW AUXILIARY HOSPITAL FOR GREENOCK.—It is proposed to build an auxiliary hospital for Greenock in the Kip Valley at a cost of £60,000. Provision is made for 38 beds and the building will be equipped with an up-to-date operating theatre.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—Dr. James Wheatley, county medical officer of health for Shropshire, has been elected President of this Society for 1927–28, and will deliver his presidential address at the house of the Society on Friday, Oct. 21st, at 5 P.M.—The annual dinner will be held at the Piccadilly Hotel, London, W., on Thursday, Nov. 17th, when the Minister of Health and the President of the Board of Education will be the principal guests.—The Neech Prize for the best paper read before a branch or group of the Society has been awarded for last session to Dr. E. H. R. Harries, medical superintendent of the Birmingham City Hospitals, for his paper on the Serum Treatment of Scarlet Fever.

MEDICAL CERTIFICATION OF INCAPACITY OF INSURED PERSONS FOR WORK.

A CIRCULAR (Memo. 307/I.C.) for the information of insurance practitioners has just been issued on behalf of the Ministry of Health for England and Wales and the Scottish Board of Health. It has been prepared with a view to assisting insurance practitioners in the discharge of their duties under the Medical Certification Rules. The first part of the memorandum consists of a discussion on the general meaning of the term "incapable of work," in the hope that a concise statement of certain main points on which there has been general agreement will be welcomed by practitioners. The statement does not purport to be a legal definition by the Ministry, but is a summary of views generally accepted by those responsible. In the first place it has not been held to be necessary for the purpose of establishing a title to sickness or disablement benefit, that the insured person should be found to be incapable of work in the sense of being completely unable to carry out the physical or mental processes which constitute "work." An insured person has been regarded as "incapable of work" through some specific disease or bodily or mental disablement when he is in such a condition that an attempt to work would be seriously prejudicial to his health. If it seems likely that he will soon be able to resume his former work, it is unreasonable to expect him to undertake other work in the meantime, and he may be properly regarded as incapable of work in the interim. But there has been some misunderstanding by practitioners as to their duties in cases where there is no reasonable prospect of the patient again being able to resume his ordinary occupation. Here a different criterion from that of fitness for that occupation must be applied, and the patient should not be certified as incapable of work unless in the practitioner's opinion he is physically unable to perform any other suitable kind of remunerative work, whether at once or after a short course of training. It is then the business of the approved society concerned to determine (subject to the member's right of appeal) for what period the payment of benefit should reasonably continue. A note as to pregnancy concludes this part of the memorandum; the State is not regarded here as necessarily rendering the insured person "incapable of work." While in some persons incapacity for work may be partly or wholly due to pregnancy, others will not be incapacitated.

The second part of the circular is more definitely concerned with the rules and regulations of medical certification. Clear and precise instructions as to the forms and dating of certificates and as to the details of procedure are set out. The proper use of first, second, and subsequent certificates are concisely explained, also the regulations governing voluntary certificates, advice as to additional benefits, exempt persons, persons receiving hospital treatment, and persons over 70 years of age. The caution given in a previous memorandum against the ante-dating or post-dating of certificates is repeated, and practitioners are asked to resist any importunity from insured patients or others in this matter. Among other points dealt with are certificates on death of patient, certificates in cases where benefit is not claimed, and certificates in respect of patients referred to the regional medical officer. It is noteworthy that the responsibility of the regional medical staff is confined to that of *advising* societies and practitioners respectively, and the practitioner is not precluded from giving certificates of incapacity to a person who has been stated by the regional medical officer to be capable of work, if the practitioner is of opinion that the patient is in fact incapable of work.

Some helpful explanation is given of the practitioner's duties in those cases where the certificate issued by him is intentionally vague because a precise statement might prejudice the health of the patient or inflict upon him unwarrantable injury. Here a special form of certificate must, in addition, be sent to the approved society and a detailed statement of the circumstances to the regional medical officer. The difficulties of early diagnosis are realised, but practitioners are warned that the approved societies cannot be expected to accept without question certificates containing general terms (such as "fever" or "debility") unless they find that these terms are used by the practitioners only when they have not yet been able to make a more precise diagnosis. It is suggested that at least such additional information as "debility with anæmia," "debility with high temperature," or "debility with dyspepsia" might be given even at an early stage. A final caution against laxity in certification and in the custody of books of certificates concludes the memorandum.

Medical News.

WEST LONDON HOSPITAL.—At 4 P.M. on Monday, Oct. 3rd, Sir Henry Simson, Dean of the hospital, will open the winter session with a paper on Post-graduate Education in Obstetrics. There will be continuous instruction until Christmas in general medicine and surgery and in all special departments.

IRISH FREE STATE MEDICAL COUNCIL.—The Royal College of Physicians of Ireland last week nominated Dr. T.G. Moorhead as its representative on the Free State Medical Council. Dr. Moorhead is Regius Professor of Physics in Dublin University and one of the physicians to Sir Patrick Dun's Hospital.

POISONING BY TINNED TOMATOES.—At an inquest held at Sheffield on August 24th it was stated that a whole family had fallen ill after eating tinned tomatoes, and one of the children, a boy aged 5, had died two days later as a result. Post-mortem examination was said to have shown that death was due to solder in the tin having been dissolved by the acid juice of the fruit.

CHELSEA CLINICAL SOCIETY.—The annual dinner will be held at the Café Royal, 68, Regent-street, W., on Tuesday, Oct. 25th, at 7.30 P.M. (Reception at 7 o'clock.) The following subjects will be discussed at meetings of the Society during the session: Focal Sepsis (Nov. 15th), Orthopædics in General Practice (Dec. 13th), What to Prescribe and Why (Feb. 21st), Modern Aspects of Dentistry (March 20th), the Future of Gas Warfare (April 17th), and the Clinical Value of Biochemical Methods (May 15th). All these meetings will be preceded by a dinner at the Hotel Rembrandt at 7.30 P.M., and will begin at 8.30. There will also be a clinical meeting at St. George's Hospital on Jan. 17th at 8.30 P.M.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On Sept. 19th the Westminster Hospital will start a fortnight's course in medicine, surgery, and the specialties. There will be lectures, demonstrations, and operations from 10.30 A.M. to 5.30 P.M. (fee £3 3s.). On the same date the Royal National Orthopædic Hospital will start a two weeks' course consisting of lecture-demonstrations from 11.30 A.M., operations at 9.30 A.M. or 10 A.M., and out-patient work each afternoon (fee £2 2s.). During October courses will be given in antenatal work at the Royal Free Hospital (limited to ten) on Fridays at 5 P.M. (fee £1 1s.); in cardiology at the National Hospital for Diseases of the Heart, from 10 A.M. to 4 P.M. (limited to 20, fee £7 7s.); in diseases of children at the Victoria Hospital and Paddington Green Hospital, all day (fee £3 3s.); in diseases of the throat, nose and ear at the Central London Throat, Nose and Ear Hospital, all day. This course is divided into two parts, clinical and operative, which may be taken separately or together, the numbers for the operative class being limited (fee £5 5s. for clinical course and £7 7s. for operative class). There will also be courses in electrotherapy at the Royal Free Hospital on Wednesdays, at 5.15 P.M. (fee £1 1s.); in gynæcology at the Chelsea Hospital for Women, mornings and/or afternoons (fee £5 5s.); in tropical medicine at the London School of Hygiene and Tropical Medicine, on Tuesdays and Thursdays, at 2 P.M. (fee £2 2s.), and in neurology at the National Hospital, Queen-square, for two months. A series of Fellowship lectures entitled Practical Hints in Medicine, Surgery, and the Allied Specialties will be opened by Sir Humphry Rolleston on Monday, Oct. 17th, at 5 P.M. There will also be series of weekly clinical demonstrations in medicine, surgery, and ophthalmology open to members of the medical profession without fee. Copies of all syllabuses and of the general course programme are obtainable from the Secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

Appointments.

JORY, NORMAN A., F.R.C.S., has been appointed Ear, Nose, and Throat Surgeon, Royal Northern Hospital, London.

Surgeons under the Factory and Workshop Acts: CHEESE, F. W., for the Ludlow District, Salop; HASKINS, N. H. H., for the Deal District, Kent; MARTIN, E. W. D., for the Tunbridge Wells District, Kent; OAKEY, T. J., for the Darlaston District, Stafford; ROBINSON, F. W., for the Leiston District, Suffolk; ROGER, H., for the Towcester District, Northampton; SWAINE, R. O., for the Bognor District, Sussex; TAYLOR, W. A., for the Aylesbury District, Buckingham; THOMAS, W. S. R., for the Warlingham District, Surrey.

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne District Infirmary.—H.S. At rate of £150.
Bath, Ministry of Pensions Hospital.—Jun. M.O. At rate of £300.
Birmingham City.—M.O.H. £1800.
Birmingham and Midland Eye Hospital.—Jun. H.S. £110.
Bristol Education Committee.—Asst. Sch. M.O. £600.
Cambridge, Addenbrooke's Hospital.—Cas. O. and Res. Anæs. At rate of £130.
Cardiff City Mental Hospital, Whitchurch, nr. Cardiff.—Sen. Asst. M.O. £550.
Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—Sen. and Jun. H.S.'s. At rate of £100 and £50 respectively.
Derbyshire Education Committee.—Asst. Sch. M.O. £600.
Doncaster Poor-law Institution, Balby.—Res. M.O. £220.
Evelina Hospital for Children, Southwark, S.E.—H.P. At rate of £120.
Halifax Royal Infirmary.—Third H.S. At rate of £100.
Hospital of St. John and St. Elizabeth, 40, Grove End-road, N.W. Res. H.P. At rate of £100.
Ipswich, East Suffolk and Ipswich Hospital.—Two H.S.'s and one H.P. Each at rate of £100. Pathologist. £650.
Lister Institute of Preventive Medicine, S.W.—Research Fellowship in Bacteriology. £500.
Liverpool Port Sanitary Authority.—Asst. Port. M.O. £700.
London Homœpathic Hospital, Great Ormond-street, W.C.—3 Res. M.O.'s. £100.
London Jewish Hospital, Stepney Green, E.—Hon. M.O. for Dept. for Dis. of Skin. Also Hon. Asst. S. for Dis. of Eye.
Lord Mayor Treloar Cripples' Hospital, Alton and Hayling Island, Hants.—Asst. Res. M.O. £300.
Macclesfield, Parkside Mental Hospital.—Res. Clin. Asst. £75.
Manchester, Ancoats Hospital.—H.S. At rate of £100.
Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Res. M.O. At rate of £125. Also Jun. Res. M.O. At rate of £50.
Manchester Ear Hospital, Grosvenor-square, All Saints.—Non-Res. H.S. At rate of £150.
Manchester, St. Mary's Hospital, Whitworth-street.—Two H.S.'s. Each at rate of £50.
Manchester, Salford Royal Hospital.—Two H.S.'s. Each at rate of £125.
Manor House Hospital, Golders Green, N.W.—H.S. At rate of £200.
M.A.B. Mental Hospitals Service.—Sen. Asst. M.O. £650.
Miller General Hospital for South East London, Greenwich-road, S.E.—H.P. £125.
Nottingham General Dispensary.—Res. Surg. £250.
Otago University and Dunedin Hospital, New Zealand.—Sen. Res. Surg. O. £500.
Prince of Wales's General Hospital, Tottenham, N.—H.S.'s and H.P.'s. At rate of £120 and £90 respectively.
Royal London Ophthalmic Hospital, City-road, E.C.—Asst. S.
Royal National Orthopædic Hospital, 234, Great Portland-street, W.—H.S. At rate of £150.
Royal Northern Hospital, Holloway, N.—Anæsthetist. £10 10*s.* Also H.P. and Obstet. H.S. Each at rate of £70.
St. John's Hospital for Diseases of Skin, 49, Leicester-square, W.C.—Pathologist. £100.
St. Peter's Hospital for Stone, &c., Henrietta-street, Covent-garden, W.C.—H.S. At rate of £75.
Salisbury General Infirmary.—H.S. £150.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Anæsthetist. £30.
Sheffield, Jessop Hospital (Firth) Auxiliary.—Res. M.O. £175.
Sheffield Royal Hospital.—Res. Anæsthetist. At rate of £80.
Southampton, County Borough Isolation Hospital.—Res. M.O. £360.
South London Hospital for Women, South Side, Clapham Common, S.W.—H.P. and three H.S.'s. Each at rate of £50.
Stoke-on-Trent, North Staffordshire Royal Infirmary, Hartshill. H.S. to Eye, &c., Depts. £150.
Swansea Hospital.—H.S. £150–£200.
Watford, Peace Memorial Hospital.—Res. M.O. At rate of £150.
Westminster Hospital Medical School.—University Readership in Pathology. £800.
Woking Urban District Council.—Part-time M.O.H. £350.
Wolverhampton and Midland Counties Eye Infirmary.—H.S. £200.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Exmouth (Devonshire).

Births, Marriages, and Deaths.

BIRTHS.

ANGUS.—On August 30th, the wife of Alan Angus, M.D. Durh., Oxford-terrace, Gateshead, of a son.
DOHERTY.—On August 31st, at Welbeck-street, London, the wife of W. D. Doherty, M.A., M.Ch., F.R.C.S., of a son.
EDE.—On August 29th, at Strangeways, Calne, Wilts, the wife of Cuthbert Ede, M.D. Camb., of a son.
LITHERLAND.—On August 28th, at Milton Lodge, Wigan, to Doris Litherland, M.R.C.S. Eng., L.R.C.P. Lond. (née Knowles), the wife of Henry Litherland, L.S.A. Lond.—a son.
RAMMELL.—On August 31st, the wife of Dr. John Rammell, of St. Albans, of a daughter.
SLATER.—At Stagsden Nursing Home, Bournemouth, on the 14th August, to the wife of J. McDonald Slater, M.B., F.R.C.S. Edin., a daughter.
STEVENS.—On August 28th, at Redholme, Thame, the wife of A. Langley B. Stevens, M.B., B.Ch. Oxon., of a son.
WEBSTER.—On August 7th, at Baroda, India, the wife of Captain W. J. Webster, M.B., Ch.B. Aberd., of a daughter.

MARRIAGES.

McCANN—PAPIER.—On Sept. 4th, at Bombay, Captain J. G. McCann, I.M.S., M.R.C.S. Eng., L.R.C.P. Lond., to Miss Gabriel Papier.
SOMMERVILLE—RILEY.—On Sept. 1st, at St. Anne's Church, Kew, Surrey, Angus Christopher Sommerville, M.R.C.S. Eng., L.R.C.P. Lond., of Otford, Kent, to Joan Riley, Kew-gardens, Surrey.
STARKEY—McLEMAN.—On August 30th, at St. Columba's, Church of Scotland, Pont-street, S.W., Richard Scott Starkey, M.A., M.B. Camb., of Amersham, Bucks, to Barbara Alice Mary, elder daughter of the Rev. John and Mrs. McLeman, of the U.F. Manse, Methil, Fife.

DEATHS.

ACTON.—On Sept. 1st, at Wrentham, Charles James Acton, M.R.C.S., L.R.C.P. Lond., D.P.H., of Wangford, Suffolk, aged 65 years.
ADAMS.—On August 28th, at Kenninghall, Norfolk, William David Adams, M.A., M.B., C.M. Edin.
ALLAN.—On Sept. 2nd, at Croydene, Croham-road, S. Croydon, Arthur Percy Allan, M.D., B.S. Lond., aged 59 years.
BARNES.—On Sept. 2nd, at St. Edmund's, Pontac, Jersey, Edgar George Barnes, O.B.E., M.D. Lond., L.S.A., M.R.C.S. Eng., in his 79th year.
ELLIOTT.—On August 20th, at 113, Grove-road, Walthamstow, Frank Percy Elliott, M.B., C.M. Aberd., aged 57.
GIBBES.—On August 25th, 1927, Cuthbert Chapman Gibbes, M.D., M.R.C.P. Lond., 89, Harley-street, aged 76.
MACVICKER.—On August 30th, at a nursing home, Clifton, Charles George MacVicker, M.B., B.Ch., B.A.O.R.U.I.
NEILD.—On August 29th, at Shaugh Cottage, Hartfield, near Tunbridge Wells, Edith Neild, M.B. Lond., L.R.C.P., L.R.C.S. Edin., aged 53 years.
TYSON.—On Sept. 5th, at Folkestone, William Joseph Tyson, M.D. Durh., F.R.C.P. Lond., F.R.C.S. Eng., Chairman Royal Victoria Hospital, Folkestone.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Committee 49 cases were considered and £776 10*s.* 8*d.* voted to 43 applicants. The following is a summary of some of the cases relieved:—

Widow, aged 34, of M.B. Glasg. who died in May last. Left with two children, boy 10, girl 9. Would willingly support herself and children, but employment is difficult to obtain owing to not being trained. Temporary grant of £3 given.

L.R.C.S. Edin., aged 72. Married, no children. Through continual ill-health applicant and his wife have had to live upon their savings which are now reduced to £81. Only income Epsom Pension £40 and old age pension £26. Rent and rates £26. Voted £40 in quarterly payments.

M.B. Glasg., aged 66. Carries on a pharmacy which was purchased with his late wife's money. On the death of his wife all her money went to her relations. The local secretary of the Fund reports that applicant's memory is so bad that he is not capable of following his profession or business. Rent £40 inclusive. Special grant of £5 and £40 in 12 monthly instalments voted.

Daughter, aged 70, of M.R.C.S. who died in 1883. Two sisters and a brother live together. One sister an annuitant of the Fund. They share expenses. Applicant asked for help towards a holiday. £5 voted.

Widow, aged 72, of M.R.C.S. Eng. who died in 1902. Brother-in-law provided for applicant and her family until 1921. Eldest a cripple from 7 years of age. Daughter aged 43 earning £2 a week. Advised to take a boarding-house, but not being able to get tenants is unable to meet expenses and asks for a grant towards rates. Voted £18.

Subscriptions may be sent to the Hon. Treasurer, Sir Charters Symonds, at 11, Chandos-street, Cavendish-square, London, W. 1.

Notes, Comments, and Abstracts.

PATHOLOGICAL AND BACTERIOLOGICAL LABORATORY ASSISTANTS' ASSOCIATION CONFERENCE.

THE second conference of the Pathological and Bacteriological Laboratory Assistants' Association was held in the Department of Pathology, University of Cambridge, from August 22nd to 26th. In the absence of Prof. H. R. Dean (the President), Mr. W. A. Mitchell (the Vice-President) introduced the Rev. G. A. Weekes (Vice-Chancellor of Cambridge University), who declared the conference open. He said that he had heard of no other association of the kind existing in any of the other great scientific departments. The members of the Association wanted to increase scientific knowledge, to compare methods and techniques, and to give one another results of their own independent investigations. They were not intending to be merely useful and competent officials. It was significant of the high standard of tradition in the work of the scientific departments, in laboratories, that people were prepared to spend part of their holiday in a conference of this kind. He recalled the words of Pasteur, that in the realm of research luck only favoured the minds that were prepared. Discoveries were not made by people through luck alone. The "esprit préparé" could be gained not only by listening to lectures and discussions, but by the more informal and social meetings, when workers met and compared experiencee, and went away regarding everyone in that domain as a brother and comrade.

The Vice-President delivered a lecture on Cambridge, illustrated by lantern slides, and then presented the Junior Greenfield Prize and Medal to Mr. Edward B. Brain (Birmingham) for a number of colour drawings of pathological subjects.

The following lectures and papers were delivered: Standard Dietary for Rabbits and Guinea-pigs, E. Pleasance (Cambridge); The Manufacture of Small-pox Vaccine as Carried Out in the Laboratories of the Shanghai Municipal Council, A. E. P. Grimmo (Shanghai); Antagonism and Symbiosis of Bacteria, J. J. Ritchie (Edinburgh); The Development of Parasitology, Prof. G. H. Nuttall, F.R.S.; Cinema Films of Scientific Interest, G. Harper (Birmingham); Virulence Test in the Identification of *B. Diphtheriæ*, S. Denyer (London); Diversions of an Overseas Laboratory Assistant, A. Saunders (South Georgia); Rare Fæcal Organisms which Simulate Pathogens, J. McLean (London); The Preparation of Plague Vaccine, F. Leeson (Gold Coast); Laboratory Work in a Spa Hospital, S. Linfoot (Harrogate); The Biuret Reaction, E. C. Haddon (Uganda); Difficulties Encountered in the Differentiation of Paratyphosus A, B, and C, S. J. Denyer (London); The Mounting of Frail Museum Specimens on Wax Plates, H. Gooding (Manchester); Tissue Culture Technique, V. C. Northfield (Cambridge); A visit was made to the Institute of Animal Pathology and a demonstration of the method of producing antitoxin was given by A. G. Thompson. Veterinary specimens were shown by E. F. Hughes.

An exhibition of laboratory work and apparatus was on view during the conference; tissue culture exhibits showed stained preparations, a pulsating heart culture, and dark ground preparations of mitosis in living cells. The exhibits were as follows: The Cultivation of Protozoa, W. Cooper and W. J. Muggleton (London); Specimens of Malignant Pustule, F. J. Drury (Northampton); Examples of Artistic Portrayal of Medical and Surgical Conditions, D. Kidd (Liverpool); Photomicrographs, G. R. Armstrong (Cardiff); Micro-filaria found in Human Blood, C. E. Berry (London); Micro-chemical Apparatus, C. W. Ashton (Manchester); Sections of Central Nervous System, H. Gooding (Manchester); The Evolution of the Method of Mounting Specimens in Gelatine according to the late Prof. Delépine's Methods, F. Simons (Manchester); Diagrams of Morbid Histological Conditions, R. Muir (Edinburgh); Chromogenic Organisms, Photogenic Organisms, Sections illustrating Common Pathological Conditions, Bacteriophage, Living Wandering Cells, Pathological Specimens, members of the Department of Pathology, Cambridge.

The Sims Woodhead Medal was presented to Prof. Lorrain-Smith, F.R.S., the Association's first President, in recognition of his great services to the Association since its formation in 1912. Mr. Richard Muir accepted the medal on behalf of Prof. Lorrain-Smith, who was unexpectedly prevented from being present. The conference dinner was held in the dining hall of Trinity Hall on Thursday evening; 104 members and guests were present. The principal guests were the Vice-Chancellor and Prof. G. H. Nuttall.

The attendance at the conference was fully representative of this imperial organisation, including members from as far afield as the Gold Coast, South Georgia, Shanghai, as well as from all parts of the British Isles.

POST-GRADUATE STUDIES IN MANCHESTER.

THE chief feature of post-graduate work in Manchester during the coming academic year will be a new series of courses given by the University and the hospitals attached to it. While the successful hospital lectures given in the last few years have been arranged chiefly for medical men in the full swing of practice, the University courses are designed for those who can give up consecutive periods for intensive study. They form the foundation of a post-graduate school, which it is hoped to develop in the near future. The immediate courses are: an intensive one in medicine and surgery, Sept. 12th–30th, and in obstetrics and gynæcology from Oct. 1st–8th. From January to March part-time courses on tuberculosis and diseases of the ear, nose and throat will be arranged for the benefit of medical officers of health, school medical officers, and those engaged in maternity and child welfare work. Application should be made to the Dean of the Medical School, from whom information may be obtained.

The Royal Infirmary offers an attractive programme of lectures on Tuesday and Friday afternoons. In addition to those given by the acting members of the honorary staff, Dr. E. M. Brockbank will lecture on some points in the medical aspect of the industrial history of Lancashire. Mr. Spalding, of the Deaf and Dumb Schools, will demonstrate advances in the training of the deaf child, Dr. Veitch Clark will speak on immunisation against diphtheria and scarlet fever, Dr. W. M. Roberts will explain his recent work on gastric analysis, and Dr. A. D. Macdonald will describe the physiology of shock. The Lloyd Robert Lecture for the year will be given at St. Mary's Hospital, Whitworth-street, on Nov. 1st by Dr. Hector Charles Cameron on the Child in General Practice: A Study both of Temperament and Disease.

DIAGNOSIS IN EXCELSIS.

A CORRESPONDENT in New Zealand has sent us a copy of the "Medical Pickwick," vouching for the truth of an episode which is humorously illustrated. To the doctor's inquiry of the patient as to what he had eaten for dinner, the patient said that he could not remember, but asked: "Can't you tell by looking at my index-finger?"

MADD DOGS.

To the Editor of THE LANCET.

SIR,—In the interesting note on Madd Dogs in THE LANCET of August 13th the writer is of opinion that the fact of "poore Pompey" being "sent to be made" suggests that Pompey was an inanimate object. Is it not more probable that Pompey was a sporting dog—probably a pointer—and that he was sent to be "made" or trained in the same sense that a hunter or steeplechaser is "made"?

I am, Sir, yours faithfully,

Clevedon, August 17th, 1927. R. L. WASON.

THE CAMPAIGN AGAINST MALARIA.

A SENTENCE in our article last week (p. 522) might suggest that the League of Nations Malaria Commission have no confidence in "indirect" measures against malaria. We therefore wish to point out that the Commission attach very great importance to one of them—namely, "bonification"—which acts by raising the agricultural productivity of an area and hence improving the economic and educational status of the inhabitants. We should have made it clear that in all their journeys the Commission found only two regions where *antilarval* measures had been carried out on a considerable scale with definitely successful results. This finding made them lay all the more stress on indirect measures which reduce the incidence of malaria without necessarily destroying the anopheline mosquito.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 19th, to SATURDAY, Sept. 24th.—WESTMINSTER HOSPITAL, S.W. Course in Medicine, Surgery, and the Specialties. All day course. Fee £3 3s.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, Great Portland-street, W. Course in Orthopædics. All day, clinical demonstrations and lectures. Fee £2 2s.—QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, E. Course in Diseases of Children. All day, lectures, demonstrations, and operations. Fee £3 3s.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, King William-street, W.C. Course in Ophthalmology. Afternoons, clinical instruction at 2 P.M. Operations at 3 P.M. Special demonstrations at 5 P.M. Fee £4 4s.—BETHLEM ROYAL HOSPITAL, St. George's-fields, S.W. Psychological Medicine. Tuesdays and Saturdays at 11 A.M. All information from the Secretary, Fellowship of Medicine, 1, Wimpole-street, W. 1.